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INTERPERSONAL COMMUNICATION BEHAVIOR--A NORMATIVE DATA STUDY.
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INTERPERSONAL COMMUNICATION BEHAVIORS OF PUBLIC SCHOOL CHILDREN WERE IDENTIFIED AND MEASURED BY USE OF THE INTERPERSONAL COMMUNICATION BEHAVIOR ANALYSIS METHOD (ICBAM). THE FOUR BEHAVIOR LEVELS DESIGNATED - BIOCHEMICAL, MOTOR MOVEMENT, SPEECH, AND TECHNOLOGICAL - WERE RELATED TO AGE, SEX, AND SITUATION (CLASSROOM AND NONCLASSROOM) BY ANALYSIS OF VARIANCE. THE STUDY FURNISHED EVIDENCE THAT A CHILD'S ABILITY TO COMMUNICATE IS NOT LIMITED TO SPEECH, ALTHOUGH THE SCHOOL CURRICULUM CONCENTRATES ON SPEECH AND EDUCATIONAL TECHNOLOGY. IT WAS SUGGESTED THAT CULTURAL, SOCIOLOGICAL, AND PSYCHOLOGICAL VARIABLES WHICH INFLUENCE BEHAVIOR ALSO BE SUBJECTED TO RESEARCH USING THE INTERPERSONAL COMMUNICATION BEHAVIOR ANALYSIS METHOD. (GD)

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Interpersonal Communication Behavior:

A Normative Data Study, FINAL REPORT.

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CHAPTER I

STATEMENT OF THE PROBLEM

The purpose of this study was to identify and measure interpersonal communication behaviors of children. To a certain extent this was a pioneer undertaking because the literature on communication reveals no systematic, empirical data on how children communicate. Variations in communication behavior among children as well as among adults are often cited in behavioral science literature and are recognized in everyday life. These variations are not limited to speech and writing, but cover a wide variety of communication behavior even though speaking, reading, and writing behaviors of children have received the bulk of intensive and extensive research attention resulting in information regarding norms, instruments for assessing verbal, reading and writing performance, plus a wide gamut of instrumental uses of these behaviors. However, no comparable information is available regarding variations in communication behaviors which do not involve speech or written symbols, particularly those behaviors which are unique to children's interpersonal transactions. This study is a part of the effort to fill this information gap.

This study therefore issues from a wide range of preoccupations with the nature of human growth and learning. Whether or not these considerations are identified in terms such as "maturation," "learning," or "growth," they are concerned with the processes through which a single human life originates, survives, increases in complexity and changes. To reduce these processes to those within the purview of a single discipline, as has been the practice, tends to prevent the development of a science of human behavior which fits the total image of man. Human development and growth must eventually be viewed from a larger perspective than that provided by any one of the traditional disciplines.

There is at present a re-emphasis upon human behavior, particularly among those disciplines which are concerned with social problems. Grinker (1964) in an article entitled "Psychiatry Rides Off In All Directions" made an eloquent plea for his discipline to return to behavioral observations and to deductions from behavioral data. McCrory (1965), in an address to the Society for Pediatric Research, stated that of 811 ongoing research projects cited by 75 departments responding, only 32 had to do with behavioral science... "The papers on developmental biology have been too numerous to mention but the papers on developmental behavior have been regrettably few." Krasner and Ullmann (1965) in editing their "Case Studies on Behavior Modification" take their clinical psychological and psychiatric colleagues to task for reversing the processes of science by trying to put theory into a given treatment technique; e.g., Miller and Dollard's attempt to insert Hullian learning theory into psychoanalytic constructs of personality and treatment. Bruner (1966) has cited the need in education for empirical data on human growth and development, and Gage's recent compendium on research on teaching (1963) reinforces behaviorally oriented research in education. The orientation of this study toward behavioral data is consistent with the above mentioned trend.

The importance of interpersonal communication transactions in the development, growth, learning, adaptation and survival of the individual and of the culture is mentioned repeatedly in the biological and social sciences, and rightfully so. However, these references are not matched with empirical data on the specific differentials in communication patterns of persons of different age, sex, ethnic origin, intellectual ability pattern, or other variables. Nor is there anything approaching a scientifically adequate documentation of the role of interpersonal communications in human behavior over the life span of the organism. Without such empirical data the effectiveness of those professional disciplines responsible for facilitating human growth, adaptation and learning is unquestionably restricted.

A set of postulates regarding the origins, nature and role of interpersonal communication behavior was described previously (Richmond and Buehler 1962) and is summarized in Chapter II which follows. Also, a research approach to identifying and measuring the individual use of communication behavior was proposed (Buehler and Richmond, 1963). A number of studies were conducted which used this methodology (Buehler and Richmond, 1963; Ward, 1964; Buehler, Patterson and Furniss, 1966) and its utility as a research tool was verified. Data were obtained on the differential use of interpersonal communication behavior on a limited sample of adolescents and adults, including staff members in a correctional school, psychiatrists and other professionals in a mental hospital, and nurses in a pediatrics unit of a general hospital. The accrued data and the refinement of the research method (identified in this study as the Interpersonal Communication Behavior Analysis Method, or ICBAM) led to the design of the present study.

The uniqueness of this research methodology lies in the fact that it is the only instrument developed to date which enables the researcher to record simultaneously all of the observable communication behaviors which take place in interpersonal transactional situations. There are, of course, many instruments and techniques available for measuring communication in any one of the categories included in the categorical systems utilized in this study (e.g., Blauvelt, 1956; Birdwhistell, 1960; Matarazzo and Saslow, 1960; Harlow and Harlow, 1962; Nathan, Schneller and Lindsey, 1965; Krasner, 1958 and others). Each of these has its value for minute analyses of a limited range of behavior. However, for purposes of identifying and measuring the communication behaviors utilized by people in interpersonal transactional episodes, an instrument capable of encompassing the full range of observable behavior appears necessary.

A comment is appropriate regarding the rationale for undertaking a descriptive rather than an experimental study at this juncture. It is our considered opinion that before any variable can be experimentally manipulated for the purpose of establishing its differential effects its normative occurrence, including distribution and variability, needs to be established. When this principle of scientific order is ignored, some very misleading conclusions result, as the history of science shows. In the orderly progression of science, descriptive studies precede comparative studies and both establish the base data for experimentation.

The purpose of this study therefore was to identify and measure the differential use of interpersonal communication behavior among children of public school age. This central purpose, the hypotheses and other factors involved in the design are described in detail in the following chapters. A comment at this point on the reasons for selecting a public school as the study site is pertinent.

Ideally, normative data on the communication behaviors utilized by children should be free from situational bias, but such bias-free situations do not exist. The social situation or system in which behavior is observed influences the evocation of behavior. In other words, the total repertoire of a child's or an adult's communication behavior is not necessarily utilized in any one social situation because every situation theoretically imposes different demands and limits on behavior. Therefore, a communication research design must select the social situation in which behavioral data may be obtained and which is representative of situations relevant to the group studied. A laboratory situation would provide behavioral data whose relevance to nonlaboratory social situations would need empirical testing. A nonlaboratory social situation which occupies much of the life space of a growing child is assumed to yield data more directly relevant to the long-range purpose of this study. Consequently, the public's schools were selected as the study sites.

An additional and equally important reason is that the public's schools represent society's most concerted and comprehensive effort to modify a child's knowledge and behavior in the direction of general norms and expectancies of the culture. Furthermore the school is one of the few institutions in society which utilize communication as the primary agent in accomplishing this task. The school may be aptly described as a highly organized social system which has a built-in communication system serving as its primary instrument in accomplishing its purpose. The school's effectiveness, therefore, is directly commensurate with the effectiveness of its communication systems.

An additional factor which determined the focus of this study is the fact that the literature on communication increasingly includes communication behaviors which are not classified as speech or the use of any of the technological instruments of communication. These communication behaviors are seen as playing an important role in the shaping of personality and behavior. In other words, learning results from a much wider behavioral milieu than verbal symbolic transactions alone. While this broader definition of communication has appeared to be gaining headway among the behavioral sciences, the formal communication system of a school focuses primarily, if not exclusively, upon the use of verbal and written symbols. The goals of education, the instructional technology, the educational materials are all expressed in terms of skill in the use of such symbols. At the same time there is an area of human behavior producing more or less permanent learning effects that is not presently utilized in the official communication system of the schools. The only widely accepted scientific theory of communication in the behavioral sciences has been information theory (Weiner, 1954) and this has been adopted in varying degrees in education, psychiatry, psychology, and related disciplines for want of a more comprehensive theory of communication.

It was assumed in this study that the task of education requires the full utilization of every available learning resource. When this assumption is translated into research terms, one of the tasks of educational research is to make learning resources operationally explicit. A wide range of biosocial data suggests that learning resources are not found in materials alone. They include the full range of communication behavior of the teacher, the individual student, and the social group. They include all the ongoing interpersonal transactions which occur within the social system of the school. These considerations suggest that empirical data on the interpersonal communication behavior of children in a school setting would make the full range of communication behavior more available to the school and thus increase the total effectiveness of the educational endeavor.

The present study is one of a series of projected studies and the role of these communications in human growth, learning, adaptation and survival.

CHAPTER II

COMMUNICATION AS INTERPERSONAL TRANSACTION PROCESS

In the frame of reference from which this research approach has been derived, interpersonal communication is defined as a transactional process upon which the origins, growth, adaptation and survival of the individual, the family, and the culture depend. The purpose of this chapter is to summarize the empirical bases for this frame of reference and the research methodology utilized in this study.

In presenting a biosocial theory of human behavior, Cameron and Magaret have stated:

> "Human society is built around and sustained by communication; and the behavioral organization of all individuals who participate in social interaction is continuously dependent on communicative functions." (1951)

If the behavioral organization of all individuals is continuously dependent upon communicative functions, then the process of education, too, must be viewed in terms of communication.

Implicit in the communications transactional process are, of course, all of the recognized and unrecognized problems of social learning, cultural assimilation, and personal and/or cultural deviance. Nevertheless, it is necessary that research attention should be given to those processes of interpersonal relations which find their expression in the communications behaviors of people, particularly in a field which is communications oriented.

Among the conceptual models for communication which have been advanced, the general approach of G. H. Mead (1934), Hall (1959), Thayer (1963), and others has been adopted. Their approach assumes that communication cannot be studied or dealt with apart from human behavior and that interpersonal communication involves the behavior of people in interpersonal transactions. The term "transaction" is herein used as defined by Dewey and Bentley (1949) as implying "open biological systems;" i.e., living systems which are in circular, reciprocal, participative, and functional movement, both intra- and interorganically.

> "We emphasize communication as process because it is a common denominator in human behavior. Its forms vary from culture to culture, but its function is the same among all humans. Recent developments among the biological and social sciences suggest that the many systems* involved in the human organism and in human behavior are functionally related through transactional processes and that these transactional processes may be defined as communication processes. In this sense communication functions to integrate these various systems into the whole organism and the organism into its environment."
> (Richmond & Buehler, 1962)

Furthermore, in any study of interpersonal communication it is imperative that concepts of mechanical communication structures and processes be dissociated from the human structures and processes after which they are patterned. While the former have the function of processing and storing information, with built-in feedback mechanisms for error correcting, these acts are performed by standardized instrumentation which does not transact with other instruments except as they are programmed by people to do so. Frings and Frings (1964)

> "The so-called electronic brains are only brains in that they mimic a few of the more obvious characteristics of the output side of the human brain. To a biologist, the term 'brain' is almost amusing when used for devices which have such weight and bulk for their load-level. No animal could afford to carry this much around."

Thus are the adaptive capabilities of mechanical systems limited in scope.

On the other hand, human structures and processes, while generally standardized and programmed physiologically, are, nevertheless individual, bisexual, perpetually changing, and capable of cross-reactivity, as for example; when they correctly interpret the defense and threatening posturing of other species. Human systems transact with multifarious, nonstandardized environments and operate selectively in these unpredictable environments to the perpetuation of the individual organism, the species, and the culture. The state in which the machine operates must be predictable.

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* Grinker (1956) lists five systems: The (1) enzymatic, (2) organic, (3) psychological, (4) neurological, and (5) cultural.

This point of view was stated in an interdisciplinary symposium, "Toward A Unified Theory of Human Behavior" in an address by Lawrence K. Frank, entitled "Social Systems and Culture." (1956)

> "For a unified theory of human behavior, we need a conceptual framework which will enable us to recognize the many dimensions of human behavior as observed in the cultural-social environment in addition to the geographic environment. This calls for a concept of the organism-personality whose varied behavior we are seeking to understand.
>
> "One promising approach to a unified theory is to follow the growth, development and maturation of the human child as an organism-personality from conception on. In this way we may observe how a young mammalian organism, with all the wisdom of the body, undergoes successive alterations and passes through sequences of transformations whereby he learns to live in a cultural-social field which is being maintained by the transactional processes of many human beings. Such a field need not be regarded as a separate independent organization, a more or less super-human system or mechanism, as our classical social theory has long conceived it, seeing the individual primarily in terms of how he adjusts to that system or mechanism. Rather, this field may be viewed as we are learning to conceive of other fields, as arising from the patterned transactional relations of all members of the cultural-social field, each of which carries on continual intercourse with other members of the group. Viewing his conduct and feelings as circular, reciprocal, transactional, occurring between and among persons, all the varied patterns, rituals, institutional practices and symbols of group life appear as so many different modes of communication in and through which each person can approach, negotiate and seek consummation. In this way we may view the economic, political, legal, and social patterns and transactions as defined and prescribed modes of human behavior which each member of the group must utilize if he is to communicate with others."

These transactions to which Frank alludes are obviously not limited to symbols, but necessarily include biochemical and motor transactions as well. Therefore, the concept of interpersonal transactions was extended into the biochemical and motor transactions between organisms as a means for conceptualizing the biosocial bases for interpersonal communication.

That a machine may be designed to "think" or "reproduce" itself is beside the point and confusing the issue. The precise point which must be made as a primary assumption in this frame of reference is that the transactional processes which Frank and others describe are the communication transactions which function to integrate the human organism within itself and within the environment of people on a lifespan continuum. Furthermore, change in the organism, including its behavior, is the continuing product of these selective and adaptive transactional processes.

The essential differences between mechanical and human transactional models of communication have been stated by Weiner (1954), Cherry (1961) and others. Nevertheless, research on human communication has continued to disregard communication as behavioral phenomena and has focused instead upon psychological, socio-cultural, temporal, and other variables which influence or result from communication.* It is true, as Kroeber indicates, that man is a creature set apart from all others by reason of his superior brain and his ability to use language. But in the development of a theory of human interpersonal communication behavior it is necessary to consider the many paths which led to this separateness. It is not necessary or even possible at this point to state in precise detail what these paths are or how they affect human communication behavior, but scientific integrity demands consideration of their significance. We wish merely to draw the attention of the reader to the fact that there is a communications continuum which begins with the slime mold which communicates by chemical signals. This continuum includes mammals, some of which utilize chemical and acoustical signals to a greater degree than they use visual signals, for example. It extends to and includes man, who according to some of the literature depends in part upon auditory and visual senses, but in actuality who possesses all the other means for communication as represented in the continuum. To relegate these other senses for communication to a nonverbal cache basin is scientifically irresponsible and, in view of the needs of our disadvantaged human communicators; e.g. the deaf, the blind, the mute, it is socially indefensible. The present and projected adventuring into space may also demand the use and control of a variety of different communication senses and systems as well as the built-in features of lesser animal communications systems. Recent findings indicate that the skin, which is so closely allied with the first or biochemical level of communication, is more than a "barrier;" indeed, it has been identified as a separate sensing and communicating organ. (Montagu, 1965; Montagna, 1956). To identify these processes as they are related to those involved in human communication is the focus of attention in the theoretical background and the research methodology utilized in this study. "The process of communication, regardless of the message, its purpose and effects, or the personality characteristics of the 'communicator' or the 'recipient' has not been documented to date." (Richmond and Buehler, 1962)

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*Psychological, such as meaning and purpose; socio-cultural e.g., Reusch and Bateson (1951) situational approach; the intra-personal, inter-personal, small group and societal situation; temporal, e.g., Mattarazzo and Saslow's (1960) studies on the temporal congruities in interpersonal behavior; psychiatric, e.g., Arieti's (1955) work on pathological communications of schizophrenia.

A research methodology derived from a concept of communication as interpersonal transactional behavior needs to be capable of including a representative sample of all the transactional behaviors associated with human life. In the development of this research methodology, the authors found it necessary to draw from a wide range of literature on the biosocial behaviors associated with the origins, growth, adaptation and survival of human life. It is assumed in this approach that any human behavior that is present universally regardless of the exigencies of maturation, learning, culture or time and place represents behavior which meets certain primary human needs. A communications frame of reference in which communication is defined as behavior must be grounded, not only in selected features of the culture and aspects of learning, but more basically it must be grounded in the biological origins of life.

This research approach postulates communication as transactions occurring on four primary levels of behavior. These four levels are: Biochemical, Motor Movement, Speech and Technology. The bases for this four-level system are found in the anatomical and physiological structures and processes of the human organism. Special attention has been given to the biochemical level as it is evidenced in foetal/neonate/maternal relationships since this level is not generally included in any discussion of intraorganic and interpersonal communications transactions.

Human life has its origins in intra- and interorganic transactions on the biochemical level which we have identified as the first level of communication. The relation between the mother and the foetus is immediate in terms of time and space; a relation in which the biochemical and physiological processes of the mature organism are in continuous transaction with the biochemical and physiological processes of the developing organism. The precise relation between the mother and the child has not been fully documented but a persisting traditional concept implying that the mother provides only protection and unilateral sustenance during foetal and neonate life is, with continuing research, giving way to a concept of reciprocal, participative, and interdependent transactional processes. This has been pointed up by Turner (1955) and others in analyses of the biochemical transactions occurring between the mother and the foetus through the placenta.

Further evidence of the uniqueness of the mother-foetus-neonate complex, and one which may have particular significance for man's ability to develop and perpetuate a culture, is found in the hormone Prolactin. This hormone, which is produced by the maternal pituitary gland, induces lactation and effects profound psychological as well as physiological changes in the mother.

> "It seems very probable in the light of experience with animals as well as with human beings, that individual women vary greatly in their ability to produce this hormone, and that this biochemical variation is responsible in part, not only for their differing abilities to nurse babies, but also for differences in their attitude toward babies." (Williams, 1956)

Furthermore, although women can produce this hormone there are further biochemical differences in their varying physiological abilities to metabolize it.

Although Harlow (1965) makes no attempt to investigate biochemical causation, it is not unreasonable to suspect that the biochemical differences in individuals which Williams cites may be one of the underlying causes of the inappropriate maternal behavior which Harlow observed in his experimental adult female monkeys. (p. 309)

In contrast to the inappropriate primate behaviors cited by Harlow, Blauvelt (1956) in her studies on human maternal-neonate relationships describes what she identifies as "biologically appropriate" behaviors which have value for human survival. In describing the behaviors of both the new mother (the primipara) and the newborn infant in which the infant manipulates its environment, she states that:

> "When a newborn baby moves in a behavior which contacts its mother and acts with her, this act is of biological interest. It is quite possible that its significance is a part of the feeding sequence, the reproductive sequence or both. First, the inter-relationships which occur must be defined. Then, the demonstration of their meaning may be undertaken."

These behaviors which Blauvelt has observed may be those which medical and child psychological literature, in the absence of more precise data on maternal-neonate and other maturational behavior, have termed "random." In the absence of such data the practice in our culture is to immediately clothe the newborn in wrappings which effectively prevent movement of the extremities and thereby restrict the transactions between the child and its human environment. An added restriction in maternal-neonate transactions is imposed by the withholding of the breast and substituting bottle feeding. It is at this point that culture may begin to intervene in the maternal-neonate transactional process.

That these biochemical transactions do not drop out but continue throughout life as an essential class of communication behavior is evidenced by animal research, research on maternal and sensory deprivation, anthropological research, recent research on social learning, as well as research on tactile communication. (Harlow, 1965; Blauvelt, 1956; Casler, 1961; Goodall, 1965; Montagu, 1965; Frank, 1959, and Frings and Frings, 1964). The point is emphasized in this context because of the persistent tendency in the literature to equate communication only with the use of verbal symbols. In turn, this tendency implies that biochemical and motor movement transactions drop out of the communication repertoire once speech is learned. The evidence is quite the contrary.

If these behaviors which Blauvelt and others have observed in the mother and the neonate as occurring at the beginning of a particularly vulnerable period in life are biologically appropriate in terms of survival, it must be assumed that they are a part of the transactional processes which are necessary for biosocial maturation. Furthermore, there appear to be additional needs that are satisfied through the nursing process. Harlow and Zimmerman's studies (1959) of monkeys indicate that the intake of food is not all that takes place in nursing behavior. Infant monkeys that obtained food only and were denied body contact with the mother-surrogate showed marked retardation in their biosocial development. Harlow identified this as a need to touch, a body contact need (1959). Harlow and Harlow (1965) in their further investigation of the mother-infant relation state:

> "The infant-mother affectional system is enormously powerful and probably less variable than any other of the affectional systems.* It is not surprising that this is so, because strong infant-mother ties are essential to survival, particularly in a feral environment. This system is so binding that many infants can survive ineffective mothering, and the system will even continue with great strength in the face of strong and protracted punishment by unfeeling mothers." (p. 288).

While previous research by the authors has not dealt with the area of mother-infant communication systems, our preliminary data does show that the biochemical and motor movement levels of transactional behaviors are in daily usage among humans of both sexes and all ages represented in our sample. The significant point is that speech develops later in the child's life, and slowly, and not at the expense of biochemical and motor movement transactions which are never superseded in the regulation and maintenance of interpersonal behavior. Biochemical and motor movement behaviors precede speech and continue throughout life even after speech and the technology of communication are learned, as essential processes in the biosocial survival, growth, learning and adaptation of the individual. Hall (1959) has stated that:

> "Behavior is human activity involved in survival. Symbols are an extension of behavior, and speech and writing are an extension of extensions, or symbols of symbols."

Without detracting from the importance of speech and writing in the transactions among people, it is necessary to keep speech in its proper perspective in developmental and adaptation processes. In cognitive models such as represented by Osgood, et al., (1957) and others, communication is seen as consisting essentially of symbolic processes. However, in G. H. Mead's (1934) and Hall's (1959) behavioral models, speech is but one form of communication. Hall states:

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*Harlow and Harlow identify five affectional systems: The infant-mother; the mother-infant; the infant-infant; the sexual and heterosexual; and the paternal.

> "There are ten separate kinds of human activity which I have labelled PRIMARY MESSAGE SYSTEMS. Only the first (PMS) involves language. All the other (PMS) are non-linguistic forms of the communication process." (p. 45)

Speech reduces the total dependency in some interpersonal transactions, upon biochemical and motor behavior but casual observation indicates that many vital interpersonal relations are established and sustained by other than verbal or written communication.

It is important to note again that technological instruments of communication (the fourth level of communication as defined in this study) and the human behaviors which operate these instruments are designed to project symbols of behavior in time and space. These instruments, e.g., books, radio, television, newspapers, telephone, etc., extend communication across time and space barriers but they do not replace transactional behavior in the development of the very symbols which they extend. There is ample evidence from many sources that such technological displacement of the human organism is not entirely probable or even desirable in the developmental process. Although the evidence of Harlow and Harlow (1965) alone is sufficient to establish the developmental retardation which results from the deprivation of biochemical and motor transactions, one may also cite the conclusions of Casler (1961) from his review of the research literature on maternal and sensory deprivation as supporting testimony. The former research on monkeys and the latter research on humans indicates that there are essential personality and behavioral variables which either do not develop or develop in distorted form when time, space, and technological barriers to interpersonal transactions are imposed. Recent research further delineates the role of time and space as barriers in human prenatal development as well as that which occurs postnatally.

In any discussion of human behavior it is necessary to make some assumptions regarding the energetics of behavior. This topic has been treated by a variety of theoretical terms such as "motivation," "drive," "instinct," etc. Sinnott (1961) sums up his analysis of the energetics of behavior by postulating a "Basic goal-seeking and purposiveness" found in all organic behavior, and that this in turn is an aspect of the more general, self-regulating and normative characteristics evidenced in the development and the maintenance activities of living organisms.

> "There are evidently various levels of organization, some of which are subordinate to others in a kind of hierarchy. A cell is one such level, and the processes which go on within it maintain a certain independence; but cells are organized into tissues, tissues are grouped into organs, and organs into individual organisms." (p. 34)

It is these organizational and transactional processes which make reasonable the assumption that there is an impetus to survive which characterizes life, and it is this impetus which is manifest eventually through intra-organic and inter-organic communication transactions.

The survival of the infant has been attributed by Gillin (1945) and others to the influence of culture, but it seems likely that in view of man's extended infancy (Montagu, 1965), his lack of specialized weapons for defense or aggressive behavior, and the relative, unstable character of any culture, primitive or modern, as a factor in survival, that he may have been selectively eliminated long ago if some processes other than cultural were not working to insure his survival (Herber, 1962; M. Mead, 1934; Williams, 1956; Hardin, 1961).

Learning too has been assumed to account for survival, and there is no doubt that learning results from and influences such things as level, content, frequency, etc., of transactional behavior, but certainly in the universe of organic transactions, learning is only one of the variables. Since intra-organic and inter-organic transactions are characteristic of all living systems, we can only assume at this time that the impetus is the need to survive. In other words, we assume that interpersonal communications transactions on all four levels are necessary in the biosocial development of a child and that the impetus underlying these communications transactions is the postulated need to survive.

These considerations form the bases of the methodology utilized in this study. As mentioned previously, the methodology utilizes four primary, biologically determined groups of behavior which are defined as "levels of communication." The rationale underlying the use of the term "level of communication" has been stated previously (Buehler and Richmond, 1963) as follows:

> "The concept of levels is a useful tool in the study of cumulative changes within any system. Since the human organism consists of several sub-systems which, when functionally related, contribute toward the integration of the whole, but whose parts, having developed differently, represent differing degrees of cumulative complexity, some means for identifying, describing and measuring such differentials is appropriate. The concept of levels thus serves as a basis for setting up a categorical system under which the observed interpersonal communication behaviors of an individual may be subsumed."

Each of the four primary levels of communication behavior may be divided into categories defined operationally in terms of observable movement on the part of a person during interpersonal transactional episodes. Meaning, intent, effects, etc., are rigorously excluded from the scoring system as they are seen by the authors as the observer's subjective interpretations of the behavior.

When the data represents the observer's judgment of the meaning, intent, or purpose of an observed movement, the range of subjective interpretations possible introduces complex problems of validity. A rigorously defined behavioral approach, on the other hand, reduces the question of reliability and validity of data for the simple reason that reports of observable movement have face validity in themselves - an almost one-to-one level of agreement between observers. This may be simply illustrated by two persons observing a third person walking. When the data are limited to behavioral statements, e.g., "swing the right arm," "head lowered," "left hand in pocket" etc., there is little problem of agreement between the observers, and their reports have face validity. However, if the observers are required by the methodology to judge the direction or the purpose of the walking, the problem becomes complex indeed. One observer may state: "The man is walking toward the building ahead," while the other observer, with equal propriety, may state: "The man is walking toward his friend who is waiting for him ahead." Both observers may be making valid observations, but there is zero agreement between their judgments and, more importantly, the validity of each observation and/or judgment cannot be ascertained by any statistical device. Much of the problem of reliability and validity appears to the writers to be inevitable products of nonbehavioral categories used in attempts to describe and measure human behavior. In short, the margin for error may be built into and increased by the instrument. The uniqueness of our methodology lies in the fact that any observable behavior occurring between two or more persons can be ordered to a categorical system representing biosocial processes, and the behavioral differences can then be analyzed in terms of levels. It provides, therefore, a molar rather than a molecular analysis of an individual's selective and adaptive interpersonal communications behavior. We believe this to be entirely desirable since it permits consideration of communications behaviors as they occur on a developmental continuum.

In summary, it is important to emphasize that this approach to research on interpersonal communication focuses upon the behavioral level of analysis. Other analyses are undoubtedly necessary, but confusion results when levels of analysis are not kept distinct in concept formation, in research methodology and in data analysis and interpretation. Among the many writers who identify various levels of scientific analysis, Thayer (1963, p. 222) lists four levels of scientific analysis: "the physiological, the psychological, the sociological (group-society structure and function, institutions, material and nonmaterial culture, etc.) and the technological (theory, technique, hardware, etc.). Obviously, any level of analysis might be further subdivided for refinements of observation."

The four levels of communication behavior postulated in this study are subdivisions _within the behavioral level of analysis_. Inferences may be drawn from behavioral data for a number of scientific frames of reference in addition to communication theory, e.g., for biological theory as demonstrated by Blauvelt (1956), for psychological theory as demonstrated by contemporary learning theorists and for socio-cultural theory as reflected in anthropological research particularly.

Research on biochemical and physiological processes obviously require much more than observations of blushing, crying, body contact, etc. But the latter phenomena are observable behavior and within an interpersonal transaction context they may be analyzed as communication behavior. Likewise, the mechanical processes involved in communication technology, e.g., getting an electric impulse through a telephone system, requires a technological rather than a human behavioral level of analysis. In this study the technological level of behavior refers only to the _human behavior involved in the use_ of a technological extension of the voice, e.g., reading behavior, writing behavior, telephoning behavior.

In equating communication with behavior in this study we refer again to Thayer (1963, p. 220) who stated that "one of the basic obstacles to the development of an efficacious and viable theory of communication seems to me to be the assumption that communication is a thing sui generis which can be studied and dealt with apart from behavior." He adds that failure to adhere rigorously to this when working on the behavioral level of analysis allows much conceptual "slippage." Consequently, in the interest of adhering to the behavioral level of analysis all nonobservable biochemical, neurological, emotional sociological and mechanical processes are excluded from the data. The resulting behavioral data can of course be ordered to other frames of reference but in this study the analysis is restricted to behavior as communication events.

CHAPTER III

PROCEDURES

This study was conducted during the school year 1964-65. The subjects consisted of boys and girls in each of the following age groups: 5, 7, 9, 11, 13, 15 and 17. Each subject was observed in interpersonal communication situations in classroom settings. Also, observations of the same subjects were made in a nonclassroom setting as described below. In this chapter the procedures utilized in obtaining data on subjects' differential use of interpersonal communication behavior and the hypotheses which were tested are described.

A. OBSERVATIONAL SYSTEM

1. Classification System

The Interpersonal Communication Behavior Analysis Method (ICBAM), consists of observing interpersonal communication behavior, coding this behavior in relation to the four primary levels and their eight categories and recording this behavior on the observer's Key Panel. Interpersonal communication is defined as interpersonal transactional process occurring on four primary levels of biosocial behavior. The subject's behavior in an interpersonal transaction situation is viewed as response to the interpersonal situation as events in an ongoing interpersonal process. We have avoided the use of the stimulus or signal act-response model, the model for information theory, and are tentatively defining all behaviors as response to the total interpersonal situation. It is our hypothesis that interpersonal transactional processes involve the selective and adaptive use of all four levels and are not restricted to speech and technological extensions of speech alone. The research method has been designed to demonstrate and to investigate the selective and adaptive use of these four primary levels of communication in interpersonal communication.

The four levels of communication which are postulated in this research method are: Biochemical, Motor Movement, Speech, and Technology. These four levels are subdivided into eight categories as defined below:

Communication Categories

LEVEL I. Biochemical

A. Affect

Any observable action that is autonomic and/or directed toward the self, such as: tears flowing; crying; sneezing; frowning; smiling; laughing; blinking eyes; tic movements; rubbing hands or fingers over parts of one's own body; raising, lowering or fluttering eyelids; moistening lips; wiping eyes; blowing nose; coughing; rapid breathing, et cetera.

B. Body Contact

Defined as all touching, with any part of the subject's body, any part of the other subject's body. Here the criteria of touching is a momentary or a continuous touching. Thus, one subject may touch the other's hand and this is recorded. Then the subject's fingers or hand may continue touching the other subject's hand, arm, face, or other part of the body, and this is recorded once in each interval as long as the physical contact between the two bodies continues. This continuing physical contact is defined psychophysiologically as an adient response, an active transactional process. On the contrary, when an individual's hands are clasped together without movement or when legs are dormant in a crossed position this is not an adient response or a transaction but an immobile, resting position on the part of the individual. A shift from such a stance is coded behavior in Level III, Category P.

LEVEL II. Motor Movement

Motor movement behavior is defined as any movement, whether momentary or continuous, on the part of the organism or any of its skeletal, muscular parts, such as: moving the hand alone; moving the arm alone; moving the body as a whole as in walking or running; shifting the position of a part or all of the body; nodding, shaking, turning or tilting the head; shifting the eyes; shrugging the shoulders; kicking a leg; moving the feet or a foot alone.

Observers are required to record the observed motor movement at its onset, whether it stops immediately or whether it continues. If it continues into the next interval it is recorded again. In other words, in each interval observers will record every motor movement which is observed, every separate and distinct movement or gesture, whether a part of an extremity, an extremity as a whole, two or more extremities, or the body as a whole. Subcategories of motor movement behaviors are as follows:

E. Extremities

Any movement of the body extremities such as: waving the arm; pointing with fingers; shrugging shoulders; movement of legs or feet which do not involve walking; using the extremities to demonstrate or to illustrate, etc.

H. Head

Gross movements of the head including nodding, shaking, or turning, tilting. Also, directional shifts of the eyes.

P. Posture

Defined as any shift in the position of the torso, such as: walking; running; changes from sitting, standing, or lying position; shifting weight and balance of the body from any position; leaning or propping actions.

LEVEL III. Speech

O. Oral Utterance

Oral utterance is defined as oral sound without verbal form, such as: grunts, groans, wails, humming, whistling, etc.

Record at onset of the sound. If it continues into succeeding intervals without a break, record once in each interval.

V. Verbal Utterance

Exclamations such as: "Oh," or "Ah;" speaking with one or two words; talking over an extended time without interruption. Record at the onset of verbal sound. If the sound stops and is resumed a moment later in the same interval, record it again. If it does not stop during the interval in which it began but continues without break into the next interval, record it again.

LEVEL IV. Technology

Technology is defined as the use of any instrument defined in the immediate culture as a communication tool such as: writing, reading, drawing, telephoning, doodling, et cetera. Record at the onset of the behavior. If an additional technological behavior is adopted by the subject in the same interval, record again. If the behavior goes on into succeeding intervals without interruption, record it once in each interval in which it continues.

Coding Multilevel Behaviors

Some problems arise in the coding of behavior when the behavioral operation manifests movements which are defined under more than one level. A general principle to follow here is to always record in the most biosocially advanced level (biochemical through technology). However, in instances in which more varied behavior than that which is required for the operation is observed, such as crying while talking, nodding head while talking, laughing while reading or writing, pointing with hand while talking, smiling while nodding head, record as separate acts.

It is obvious, of course, that any functional activity in any part of the person affects other parts. However, some parts invariably function

coordinately in performing some actions, as in speech (movement of the jaw, lips, tongue, alteration in breathing). However, speech does not require an eye to be lowered, or the nodding of the head, or the waving of an arm. Such behaviors are not a necessary part of the oral utterance operation and thus are scored as separate, albeit simultaneous, operations. Thus we observe multioperational behavior manifested on multilevels.

2. The Recording Instrument

As indicated above, the observational system recorded behaviors in eight categories. Observations were recorded on specially constructed instruments. Because observations were made in school situations it was necessary that the recording instrument be highly portable and durable. The unit of measure for observed behavior was a 2½-second interval. This interval was determined through previous research with the observational system (Buehler and Richmond, 1963). The occurrence of behavior in any category was recorded once during each 2½-second interval. Thus, for example, if an observer observed prolonged body contact between the subject and another individual, this was recorded once in each 2½-second interval. Likewise, if a person was engaged in prolonged talking which persisted over a relatively long interval of time, one observation was recorded for each 2½-second interval. The same was true for prolonged laughter, prolonged writing, prolonged crying, prolonged sneezing, or prolonged blushing. On the other hand, if two distinct types of behavior within any given category were observed, then one recording for each type of behavior was made in the same interval. Thus, if during the 2½-second interval the subject was observed writing and reading, two observations were recorded in the technological level. The same was true if a person was sneezing and crying or blushing and laughing during the same interval.

A battery-operated buzzer was attached to the recording instrument. This buzzer was timed to give a tone every 2½ seconds. The observer heard the tone through a small stenographic earpiece attached to one ear. Observations were recorded by depressing a lever attached to a mechanical counter. Ten such levers and attached counters were attached to the recording instrument. Eight of the levers were used to record behaviors in each of the eight categories. A ninth counter was used to record the number of 2½-second intervals included in the observation and was depressed by the observer each time the buzzer sounded. A further check was made by keeping an accurate record of the total number of minutes observed. This permitted the observer to cross-check his length of observation and permitted accurate recording of observational time. A drawing of the observational instrument is included in Appendix A, as are specifications for the components used to build the instrument.

B. COMMUNITY SETTING IN WHICH THE OBSERVATIONS WERE CONDUCTED

The subjects were students enrolled in the public schools and the private nonprofit kindergartens in Springfield, Oregon. The community is located in the upper Willamette River Valley near the University of Oregon in Eugene. Economically, the community is dominated by the lumber industry and more specifically by the presence of two large lumber mills located in the community. The city has a population of approximately 15,000 inhabitants. For the most part it is not seen as a suburb of the larger city of Eugene. Rather, it is a city in which most of the population is employed locally. The population of Springfield is probably typical of communities of similar size in the lumber regions of the Pacific Northwest. The working force in the lumber industry is quite mobile and it was noted during the selection of the student sample that many of the students who were enrolled in the public schools had attended several schools prior to the one in which they were currently enrolled. The population is predominantly caucasian and therefore contains no large segment of any racial minority group. The public school system has one senior high school, two junior high schools, and eight elementary schools.

C. THE SUBJECTS

The sample was selected so that it would cover the age range normally present in the public schools. Twenty-five boys and 25 girls in each of the following age groups were randomly selected for the study: ages 5, 7, 9, 11, 13, 15 and 17. All subjects at age levels 7 through 17 were enrolled in the public schools. All subjects in the five-year-old sample were enrolled in privately operated, nonprofit kindergartens in Springfield.

At each age level subjects were selected whose birth dates were between June 15 and December 15. Thus, the five-year-old sample included all those who became five years of age some time between June 15 and December 15 of 1964. The same was true for the other age samples. The selection process was accomplished by identifying the total number that met the selection criteria in terms of age, separating the subjects by sex, alphabetizing the names, and through the use of a table of random numbers, selecting 25 male and 25 female subjects for each age level. No attempt was made to stratify the sample in terms of academic achievement, scholastic aptitude or any other variable. Only caucasian subjects were selected for observation.

Initial attempts were made to limit the subjects to those who had all of their educational experience in the Springfield school system. This was not possible, however, because of the apparent high mobility characteristic of the population. The final sample, therefore, included only subjects who had spent all or the majority of their school years in the Springfield system.

In studies of this type there tends to be some loss of subjects and such was the case in this study. This will be mentioned more fully in the next section of this chapter. Loss of data occurred when subjects moved out of the school system, after they were initially observed in the classroom and before they were observed in the nonclassroom situation. Also there is a certain amount of voluntary participation in the nonclassroom situation for the 15 and 17-year old subjects. The lower age groups in the sample have their lunch in the school dining room where their interpersonal communication behavior was observed. However, the 15 and 17-year old students took their lunches in a variety of situations in or out of the school. Consequently some of the 17-year-old subjects who were accustomed to having their lunch away from the school resisted bringing a lunch and being observed in the arranged informal lunch situation. Thus, 38 of the subjects in the 17-year age cohort were observed in classroom settings but nonclassroom observations were obtained for only 34 of these subjects; that is, 17 boys and 17 girls.

The distribution of subjects within each age cohort from whom data were obtained is shown below in Table 1. While 50 subjects in each of the seven age cohorts were selected, observation could not be obtained on a total of 40, leaving a final sample of 310.

Table 1

Distribution of Subjects by Age and Sex

Age	Boys	Girls	Total
5	19	19	38
7	23	24	47
9	23	22	45
11	21	25	46
13	25	25	50
15	21	25	46
17	18	20	38
Total	150	160	310

D. OBSERVATION SITUATIONS

Two social situations in the school were selected as situations in which to obtain data on the differential use of interpersonal communication behavior among children. One was a classroom situation and the other was a lunch time situation.

1. Classroom Situation

Students' interpersonal communication behavior in the classroom was observed during the initial part of the class sessions, during the morning hours. Efforts were made at the beginning of the study to observe the subjects in the classroom before the teacher would formally begin the scheduled activity. The intention was to obtain a sample of a subject's behavior in a relatively more "free" situation and to compare this behavior with the subject's behavior after the situation was shifted toward the conduct of the class activities. The amount and direction of behavioral shift resulting from the situational shift would have added to the data on the adaptation of interpersonal communication in environmental demands. However, the students' time of arrival at the classroom varied so greatly, with many subjects entering the classroom only a moment before the class session commenced, that it was impossible to obtain preclass session observations of more than a very few subjects. Consequently this observation situation was omitted and observers focused only upon subjects' behavior after the class session began.

Observers sat quietly on one side of the classroom where they could observe as much of the total figure of the subject as possible. Every effort was made to "see" all the subject's behavior in as unobtrusive a manner as possible. If the subject showed obvious awareness of being observed the observer would shift his attention elsewhere for a moment. During the initial weeks of data collection one of the authors made frequent observations of the observers and, at the conclusion of the day's observations, held a critique session with all observers to reinforce the kind of quiet, uninvolved, overtly nonresponding behavior required of observers. Also, these critique sessions provided an opportunity for observers to refine the operational definitions of behavior under each of the four primary levels and their eight categories.

Each subject was observed for a minimum of ten minutes. Subject's interpersonal transactions with peers were recorded. Since these transactions normally involved different peers only the target subject's behavior was recorded. This is not an intrinsic limitation in the observational system. Buehler and Richmond (1963) found that in dyadic situations an observer can record the behavioral response of each subject. The method does make it possible to measure the congruence in communication behavior on the part of two persons but, in the interests of an orderly progression of empirical data, the investigation of congruence phenomena represents a more advanced study.

2. Nonclassroom Situations

The daily program of each school in the sample was reviewed for the purpose of ascertaining whether a situation outside the classroom could be found where the behavioral parameters were relatively constant regardless of the age of the student. The noon lunch situation appeared to approximate this criteria. Furthermore, eating together is a universal social situation in which the occurrence of interpersonal communication approximates a universal norm. In spite of the apparent fact that the presence of different teachers in the lunch rooms imposed different restrictions on student behavior, nevertheless students in all age cohorts were permitted to talk, move about, and communicate more freely than the classroom allowed. Consequently, the lunch period was used as the second observation situation for all subjects.

The initial observation of each subject was done in the classroom and within a few days the same subject was observed for at least ten minutes while eating lunch with his peers. For the subjects in age range 7 through 11 observations were done in the school lunch room where lunch was served, cafeteria style on a grade schedule. The 5-year-old sample ate in the kindergarten room. Many of the 15 and particularly the 17-year-old subjects took their lunch in a variety of situations other than the school lunch room.

These subjects were asked to bring their lunch and eat together, in small groups, where they could be observed. (They were encouraged to bring a friend or two along, which all but a few did. This insured that they had someone they knew, with whom to transact.) Some declined the invitation and consequently for these the data show only their communication behavior in classrooms.

Both situations in which observations were done were in the school and were either directly (by teacher's behavioral controls) or indirectly (by previous learning) shaped by the culture of the school. Consequently, no claim can be made that the data represents interpersonal communication behavior in a "natural" situation. The fact of the matter is that the authors question seriously the validity of the assumption that is repeated often in research literature; the assumption that nonlaboratory situations are "natural" situations. Some form of structure (or set of independent variables) is always present in a living situation, and every part of the school environment reflects the norms and expectations which are unique to the school as a social system.

E. TRAINING THE OBSERVERS

1. Training Methods

Observers were trained during the first six weeks of the project. The first phase of training consisted of two weeks during which the observers became acquainted with the observational system and theoretical frame of reference out of which the observational system was derived. Much of this time was devoted to reading and discussing research literature pertinent to communication as defined in this study. While this may not always be necessary in the training of qualified observers, it was important in this study because all of the observers were advanced graduate students at the University of Oregon and their employment as observers (Research Assistants) was a part of their research training experience.

As a part of this orientation period the observers memorized the categories within the observation system and the operational definitions of behavior included in each category. Once they had committed the system to memory they began to practice with the recording instrument.

The initial training on the recording instrument was very similar to initial stages in teaching the use of the typewriter. The trainer would call out at random the various categories included in the observation system and the trainees were required to depress the appropriate lever on the recording instrument. When they learned to depress the appropriate lever without error, the trainer began to call various behaviors within each category and the trainee would again respond by depressing the appropriate lever. The criterion for this motor behavior was perfect performance.

As soon as the observers achieved the motor performance necessary for reliable observations they began to observe actual interpersonal communication transactions between two or more individuals. They did this initially without using the recording instrument. The purpose of this particular step in the training process was to sensitize the observers to the wide range of behaviors that take place during interpersonal transactional episodes. When the trainer was satisfied that the observer "saw" all observable behavior, the observers went to the schools in which the study was conducted to informally observe the communication behavior of subjects at the various ages included in this study. During these observational experiences the trainees were instructed to look at all observable behavior in terms of the categories represented in the system and to classify all behavior within the system. Instances in which observers were unable to assign an observed act to any one of the categories became subject for group discussion and analysis.

This sensitization phase in the training of observers is seen as critical. The mechanics of operating the Key Panels simply involves motor practice. However, observers invariably require training in "seeing behavior." There are, for example, some persons who are sensitive to many more behavioral cues than other persons. Some persons are sensitive to one class of behavior included in the observation system utilized in this study and tend to be drawn to this and thus miss other classes of behavior. Some observers habitually watch the eyes of the person with whom they are interacting; others watch the face; others attend mainly to the words which may be spoken. It was interesting to note in the pilot study in which the reliability of observations with this method was established (Buehler and Richmond, 1963), that professionally trained observers such as psychologists and psychiatrists tended to attend mainly to verbal utterance (Category VII, Level III) while psychiatric aides who were responsible for the day-by-day behavior of patients recorded a much greater volume of behavior on the biochemical and motor movement levels. These habitual perceptual tendencies on the part of observers have to be modified, else the data is skewed in the direction of one or more levels. Consequently, detailed attention was given during training sessions to reduce selective perception and to increase the span of perception on the part of the observers.

Initial practice in recording observations was done by having two of the four observers observe the other two in informal transactions with both observers recording one of the observed's behavior. Omissions in recording; differences in categorizing; problems of unitizing, timing and focusing on the subject's ongoing movements were identified and correct observer behavior was reinforced. The trainer conducted repeated group sessions with the observers to develop consensus as to criteria or observer performance. During this period the observers practiced informally on each other and in a variety of social situations wherever they could observe two or more persons in interpersonal communication. The final phase of training included the observation of children in the classroom and nonclassroom settings in which the data was to be collected. The subjects for these practice observations were age-mates to those who were in the selected sample. At least two observers observed the same subject simultaneously for short periods of time after which they compared their recorded observations, noted discrepancies and refined their perceptions of behavior.

During this final phase of training, great emphasis was placed upon the observers remaining uninvolved in whatever activity took place. This point needed, and probably always in any behavioral observation study needs, repeated emphasis. The moment an observer becomes involved in the events which he is observing, his observations become selective and his own responses influence the behavior of the observed. Observers' only overt response to the objective events should be finger movement; i.e., recording what they see.

2. Interobserver Reliability

The problem of interobserver reliability and the validity of recorded data has plagued the area of psychological and educational measurement historically. The problem is compounded by the multifarious frames of reference, implicit and explicit assumptions and instrumental purposes of the many observational systems on the market. The present authors readily admit to some strong bias in this area which has influenced the design of the research methodology utilized in this study.

The bias is toward a rigorously disciplined observance and recording of observable behavior without imputing anything to that behavior. This may appear naive and primitive in view of the plentitude of instruments made up of items involving personality variables, instrumental variables, and other variables whose behavioral groundings, theoretical relevance and predictive efficiency are often vague, to say the least. One illustration of the latter may clarify this point. In a "Classroom Observation Code Digest" (Cornell, Lindevall and Saupe, 1952) is included the following item: "Received criticism well." We seriously doubt whether a panel of the most sophisticated educators and/or clinicians could simply observe a person being criticized and make a valid judgment as to how "well" or "unwell" the subject "received" the criticism. In other words, "received" is not a behavior observable, nor is "well." These words require a clinical judgment on the part of the observer and such judgments are notoriously subject to the intra- and inter-subject vagaries of the human judgmental process.

On the other hand, an item such as "body contact" (Category B, Level I) requires only that an observer see the subject touch another person, with any part of each person's body, and press a lever labeled "body contact." Such a recording has face validity. Interobserver reliability simply involves training in "seeing" and in motor movement of the finger, not in two observers sharing the same clinical, instrumental, or personalistic judgmental process.

Our justification for this radical empirical approach lies in the simple fact noted by Gage (1963) Bruner (1966) and many others, that education today lacks an empirically validated theory of human behavior. It is assumed that the origins of a theory of behavior are imbedded in behavioral data rather than in a catalog of subjective interpretations of behavior.

In spite of the elimination from the categorical system of all judgments concerning intent, purpose, or effects, some real problems of interobserver agreement persisted in this study. The central task in achieving agreement was to establish intraobserver control over his own behavior to reduce intraobserver variability. The second task was to utilize statistical controls for observer error.

Theoretical approaches to the statistical control of observer error differ. Medley and Mitzell (1963) tend to control such behavior by including in their analyses (usually an analysis of variance) a control for observer influence. An analysis of variance is accomplished by including a main effect for observer and therefore isolating that source of variation when looking at other main effects. Other writers, e.g., Schalock, Beaird, and Simmons (1964) attempt to minimize or control observer error by providing evidence that the observers are all obtaining the same or essentially the same information as evidenced by simultaneous observation of subjects. Neither approach is fully satisfactory. Other investigators have used analysis of variance to account for or to isolate interobserver variation. On the other hand, attempts to present evidence that all observers are observing the same events in essentially the same way are often less than satisfactory.

These attempts often rely upon measures of interobserver reliability as an intercorrelation between observers; e.g., per cent of error scores between pairs of scores or (Flanders, 1960) use of a chi-square technique and the resulting statistic pi. Intercorrelations between observers over categories in an observational system result in spuriously high evidence of interobserver reliability simply because of the nature of the observational system. Per cent of agreement scores between pairs of observers are not always applicable to a given observational system and the same is true for the pi technique used by Flanders.

While the investigator has many alternative avenues open to him, his choice of the appropriate way to describe interobserver reliability or to account for interobserver variability must be weighted in the context of the limitations of each technique. One alternative that perhaps is more appropriate is for the investigator to simply report actual observational data which permits his reader to determine for himself the extent of the reliability of the observations and of the observational system itself.

The problems described above were all encountered in this study. All observers tended to respond to one or more classes of behavior at the expense of other classes. Further, the observers apparently attempted to compensate for such attraction at various stages during an observational setting. With the observational system used in this study, it was apparent that interobserver reliability was perfect within those categories where the frequency of the behavior was low. On the other hand when the frequency within a given category increased the interobserver agreement decreased. In other words, the rapidity of movement to be observed affects the reliability of observations.

Correlational data in this study indicates high agreement between observers. However the observations in general were found to be of sufficient variability to indicate that whenever possible this source of error be controlled through statistical treatment of the data. Therefore, it will be noted in the following chapter, when analysis of variance techniques are utilized these analyses include main effects for different observers, whenever possible.

F. HYPOTHESES

The hypotheses, as stated in the study proposal, were as follows:

1. "Normative data on the interpersonal transaction behavior of children and adolescents in terms of four primary categories, which are postulated as levels of communication, can be obtained.
2. The biochemical and motor movement levels of interpersonal communication normally associated with the prespeech age of children continues throughout childhood and adolescence.
3. Utilization of the levels of communication varies systematically with chronological age.
4. There are significant differences between sexes in the utilization of levels of communication.
5. Utilization of levels of communication does not correlate with intellectual ability, as measured by existing school records of intellectual ability.

6. **Utilization of levels of communication correlates with academic achievement.**

7. **The utilization of communication behavior on levels I and II tends to be less frequent in formal educational situations (task oriented class situations) than in informal situations.**

The above hypotheses will be reworded in null form for statistical analyses."

CHAPTER IV

RESULTS

Interpersonal communication was defined in this study as all observable behavior occurring in interpersonal situations. The study was designed primarily to provide normative data relative to childrens' differential use of such behavior. In the project proposal (1964) it was stated that: "The speaking, reading and writing behavior of children have received considerable research and professional attention, but communication behaviors which do not involve speech or written symbols have received comparatively little attention. There are no standardized measurement techniques or norms for communication behavior not involving speech or written symbols, despite the widespread recognition of the personal educational significance of this behavior." This project has focused upon this gap in empirical data on communication behavior.

Before norms can be approximated, the capabilities of a norm producing instrument must be established. The instrument must identify and measure hypothesized differentials in the phenomena being normalized. Consequently, the initial step in data analysis was to test the hypothesized differentials in the subjects' observed interpersonal communication behavior as obtained by the use of the Interpersonal Communication Behavior Analysis Method (ICBAM).

Interpersonal communication behavior was depicted in terms of levels, i.e., Biochemical, Motor Movement, Speech and Technological. Within each level one or more categories of behavior were identified. The classification system under which the data were organized is summarized in Table 2 below.

Table 2
Classification System

Levels	I Biochemical	II Motor Movement	III Speech	IV Technology
Categories	1. Affect 2. Body Contact	3. Extremities 4. Head 5. Postural Shifts	6. Oral Sound without verbal form 7. Verbal Form	8. Technology

The sampling procedure permitted analysis of the data with respect to the following independent variables: (1) Age, (2) Sex, and (3) Situation. The project design also permitted other characteristics; e.g., achievement level and mental ability, to be randomly distributed within the sample age cohorts and correlated with observed behavior.

Before presenting the data a further comment regarding the classification system is necessary. The four primary levels of communication which were postulated were divided into a varying number of categories as presented above. If it were assumed that each of the eight categories represents one-eighth of the universe of observable communication behavior, this summation of categories under levels and conversion of level sums into ratios of total behavior would present acute statistical problems. However, such an assumption is not warranted. The essential purpose of the categories is to facilitate the identification and observation of behavior in each level. The levels and their categories are discreet and no assumptions regarding quantitative equality in the phenomenological field are necessary or warranted at this time. In the universe of observable behavior on one level, such as Level IV (Technological) there may be many more classes of communication behavior than in the three categories under Level II (Motor Movement). However, for observational purposes in this study a breakdown of Level IV into more than one category was unnecessary. Thus it is quite possible that a subject may use different communication tools several times in one 2½-second interval and achieve a higher score under Level IV (or Category 8) than in the combined categories in any one of the other three levels. Moreover, the essential question asked of the obtained data for hypothesis testing purposes was, "What is the distribution of the subject's observed communication behavior among the four levels and their eight categories?" No assumption regarding a normal distribution (e.g., 25% in each level) is warranted by the rationale underlying this study as stated in Chapter II.

A. The Dependent Variable

The dependent variable was observations of the various communication behavior utilized by the subjects. Choice of the manner in which the dependent variable is presented is dependent upon questions which are asked of the data. The range of choices available in this study was large and for this reason the dependent variable was depicted in more than one way.

Three depictions of the dependent variable were utilized. The first was in terms of ratios of observed frequencies in any category or level to the total frequency of all recorded behaviors. The depiction of the dependent variable in this manner permitted interpretation of the behavior in terms of its relative frequency. Thus it was possible to indicate what proportion of a person's total communication is speech, motor movement, etc. This was the major depiction of the dependent variables used.

To determine differences in use of interpersonal communication behavior attributable to independent variables (age, sex, situation) and in the behaviors themselves, the analysis of variance design shown in Table 3 was employed. The design was totally crossed.

Table 3

Analysis of Variance Design Used in the Study

Source of Variation

Main Effects:	Interactions:
1. Age (A)	5. A x S
2. Sex (S)	6. A x St
3. Situation (St)	7. A x B
4. Behavior	8. S x St
	9. S x B
	10. St x B
	11. A x S x St
	12. A x S x B
Within	13. A x St x B
Total	14. S x St x B
	15. A x S x St x B

Use of ratio scores in this design permitted the gaining of information only for main effects of age, sex, and behavior and interactions between these variables. Evidence relative to differences in situations could not be obtained by ratio scores since the sum scores for each case was unity and since the design was matched the εx and εx^2 for each situation was equal to N, the number of cases observed, and the resulting mean square (variance) for situations was zero.

The third depiction of the dependent variables was in terms of frequency of observed behavior per unit of time. This was a satisfactory procedure but did not, without further manipulation, reveal anything about relative use of behavior.

B. Tests of the Hypotheses

The initial questions put to the data pertain to the hypotheses which were stated in Chapter III, Page 38. These hypotheses and their relevant data are as follows:

> 1. "Normative data on the interpersonal transaction behavior of children and adolescents in terms of four primary categories, which are postulated as levels of communication, can be obtained."

This hypothesis pertains to the feasibility of the research methodology for identifying and measuring the interpersonal communication behavior of the sample subjects in the sample interpersonal situations. In part at least this hypothesis cannot be "proven" because it rests upon the validity of the assumptions from which the definition of communication has been generated. This, of course, is true of any measuring device. The criteria for evaluating a measuring device are (1) its capability for identifying and quantifying differences among phenomena and (2) the usefulness of the obtained measures in answering pertinent questions and resolving meaningful problems. Consequently, the term "proof" for this type of hypothesis is a misnomer; the important question is whether the device (which in this case is a system for classifying observable behavior) works, i.e., does it identify and measure what it purports to identify and measure and do the obtained data yield inferences that are germane to the phenomena being studied? The phenomenological context of this study was observable behavior which, in this frame of reference, is equated with communication. The base data summarized in Table 4 and Figure 1 below show the distribution of communication among the four primary levels which are postulated.

Table 4

Relative Frequency of Use of Four Communication Levels For Boys, Girls, and Combined Sexes for All Situations

Level	Mean Relative Frequency		
	Combined Sex	Boys	Girls
Biochemical	.225	.224	.223
Motor Movement	.593	.600	.582
Speech	.071	.065	.077
Technological	.111	.111	.118
Total	1.000	1.000	1.000

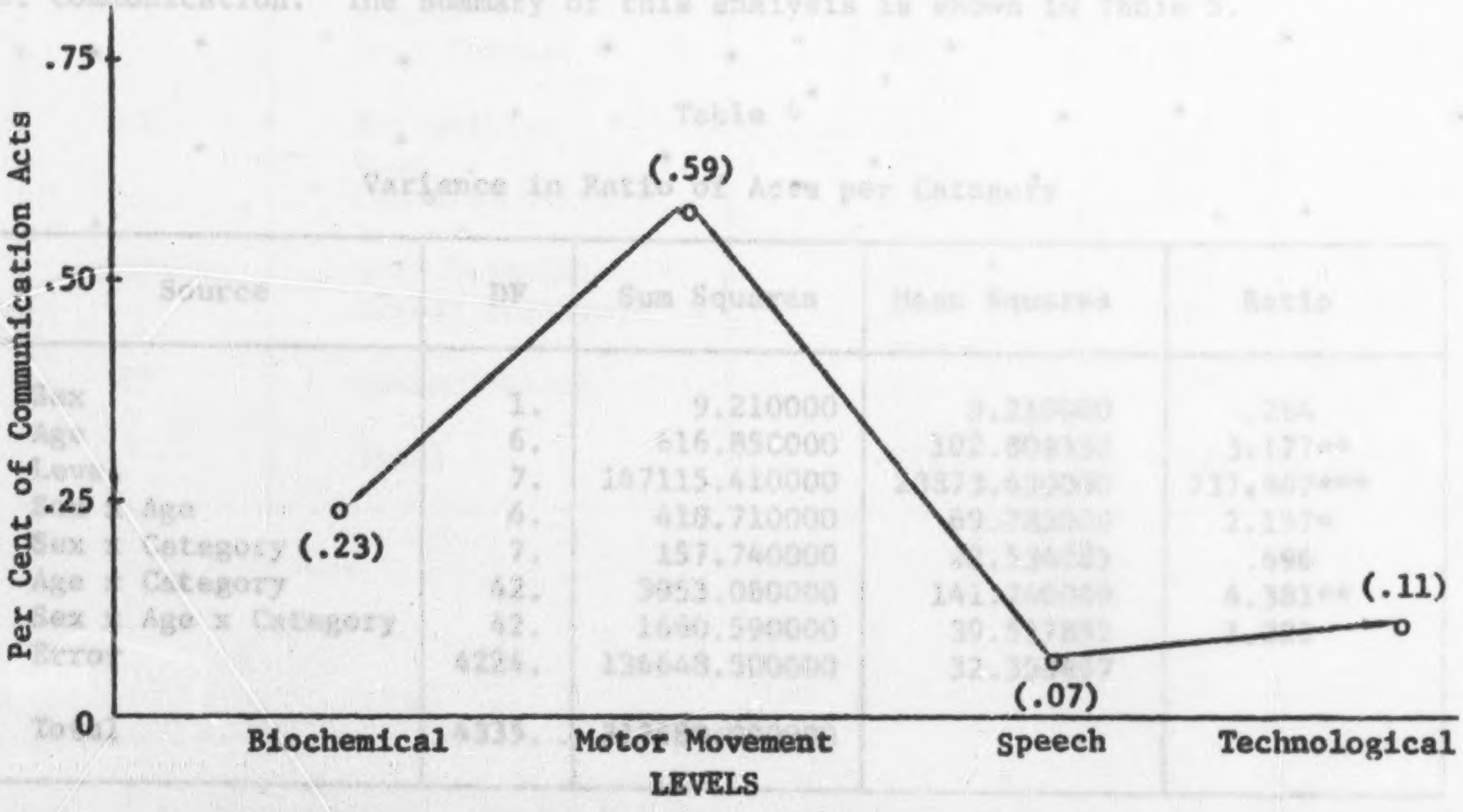

Figure 1. Relative Frequency of Use of Each Communication Level for All Ages for Both Observation Situations

An analysis of variance of these data are shown in Table 5.

Table 5

Variance in Ratio of Acts per Level

Source	DF	Sum Squares	Mean Squares	Ratio
Sex	1.	18.420000	18.420000	.201
Age	6.	1233.690000	205.615000	2.247
Level	3.	430368.500000	143456.160000	1567.952***
Sex x Age	6.	837.460000	139.576660	1.525
Sex x Level	3.	241.180000	80.393333	.878
Age x Level	18.	9273.310000	515.183880	5.630**
Sex x Age x Level	18.	1213.440000	67.413333	.736
Error	2112.	193232.500000	91.492660	
Total	2167.	636418.500000		

* p. < .05
** p. < .01
*** p. < .001

A similar analysis of variance was completed with the eight categories of communication. The summary of this analysis is shown in Table 5.

Table 6

Variance in Ratio of Acts per Category

Source	DF	Sum Squares	Mean Squares	Ratio
Sex	1.	9.210000	9.210000	.284
Age	6.	616.850000	102.808330	3.177**
Level	7.	167115.410000	23873.630000	737.967***
Sex x Age	6.	418.710000	69.785000	2.157*
Sex x Category	7.	157.740000	22.534285	.696
Age x Category	42.	5953.080000	141.740000	4.381**
Sex x Age x Category	42.	1660.590000	39.537857	1.222
Error	4224.	136648.500000	32.350497	
Total	4335.	312580.090000		

* p. < .05
** p. < .01
*** p. < .001

Tables 5 and 6 above indicate that there are significant differences in the distribution of interpersonal communication behavior between the four levels and eight categories which were postulated. Also, the correlation between age and differential use of the four levels and eight categories of communication is significant at the $p. < .01$ level.[1]

2. "The biochemical and motor movement levels of interpersonal communication normally associated with the pre-speech age of children continue throughout childhood and adolescence."

The data summarized in Table 4 and Figure 1 above, which pertain to the use of the four primary levels of communication, support this hypothesis. Table 7 and Figure 2 below pertaining to the eight categories of communication behavior present a more detailed breakdown which further supports the hypothesis.

Table 7

Relative Frequency of Use of the Eight Categories of Communication For All Ages For Both Situations

Level	Category	Mean Relative Frequency		
		Combined Sex	Boys	Girls
I	Affect	.217	.217	.217
	Body Contact	.008	.007	.006
II	Extremities	.211	.217	.203
	Head	.262	.263	.264
	Postural Shift	.119	.120	.115
III	Oral Utterance	.001	.001	.001
	Verbal Utterance	.070	.064	.076
IV	Technological	.111	.110	.118
	Total	.999	.999	1.000

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[1] In this context, use of the term "correlation" is made to refer to the interaction of two or more independent variables.

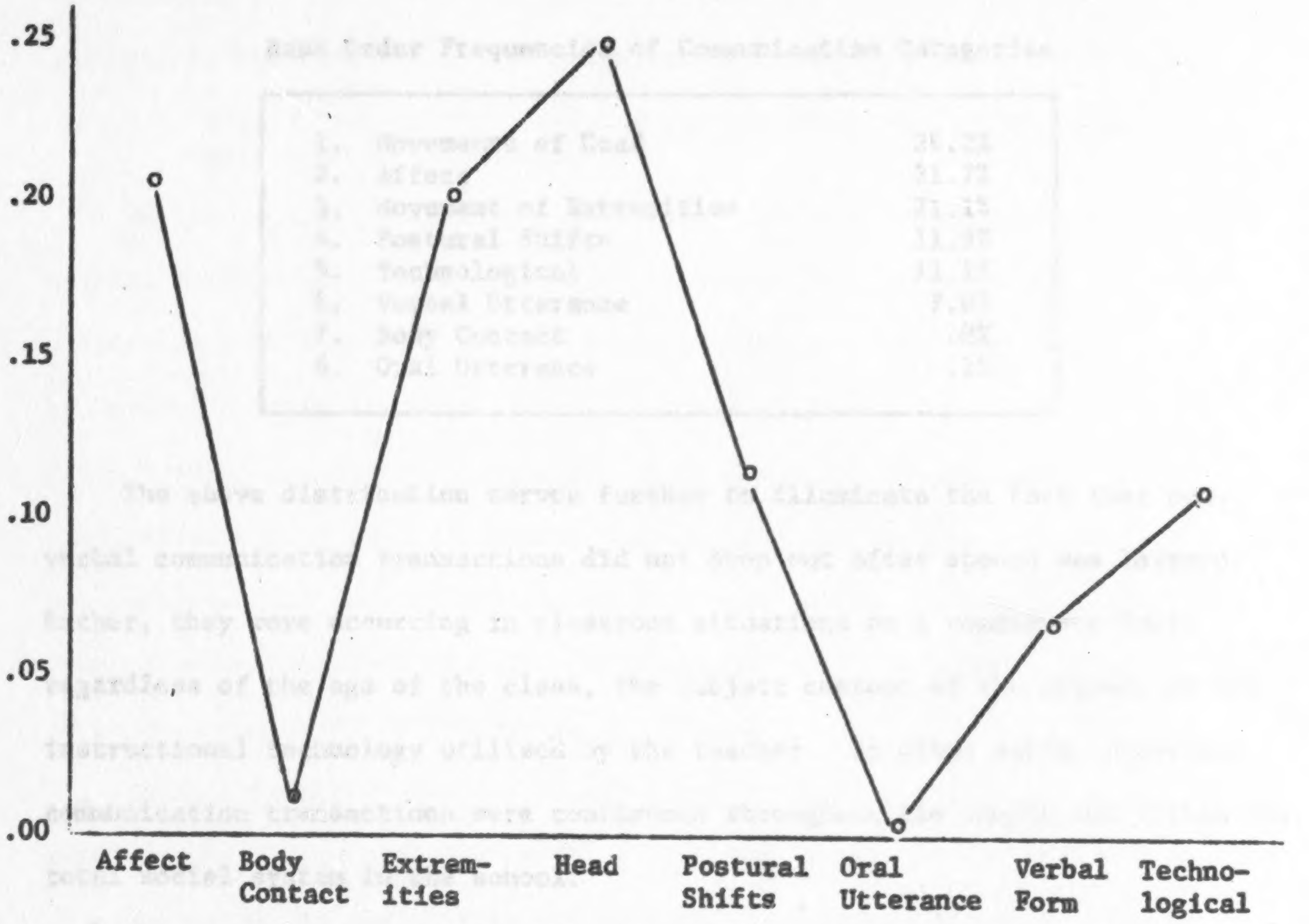

Figure 2. Relative Frequency of Use of Each Communication Category For All Ages For Both Observation Situations.

These data indicate that the vast majority (82%) of all interpersonal communication behavior among students in the sample did not involve verbal symbols, i.e., neither speech nor the technological extension of speech. Of the nonverbal behavior, motor movement constituted the most frequently used level (59% of all observed communication acts). The minor use of speech and its technological extensions (17%) in the school situations is graphic evidence that nonverbal communications continue as major levels of communication behavior after speech and its technological extensions are learned.

A rank order arrangement of the data presented in Table 7 serves to clarify the relative use of the eight communication categories on the part of the sample population.

Table 7

Rank Order Frequencies of Communication Categories

1.	Movements of Head	26.2%
2.	Affect	21.7%
3.	Movement of Extremities	21.1%
4.	Postural Shifts	11.9%
5.	Technological	11.1%
6.	Verbal Utterance	7.0%
7.	Body Contact	.8%
8.	Oral Utterance	.1%

The above distribution serves further to illuminate the fact that nonverbal communication transactions did not drop out after speech was learned. Rather, they were occurring in classroom situations on a continuous basis regardless of the age of the class, the subject content of the course, or the instructional technology utilized by the teacher. In other words, nonverbal communication transactions were continuous throughout the sample and within the total social system in the school.

The significance of these data is, of course, dependent upon relevant assumptions such as the nature of communication, the role of communication in the learning process, the role of interpersonal transactions in the teaching and learning process, and the school's objectives regarding the total learning process for children. If the assumptions underlying this study are tenable, the implications of these data for educational technology are far reaching, indeed. If, on the contrary, learning is assumed to take place through the use of only speech and its technological extensions, and not through the use of Levels I and II behavior, the nonverbal behavior of students can be ignored except when they interfere with the individual student's preoccupation with the learning of verbal symbols. It should be noted, however, that such a definition of learning would deny the validity of all current empirical data indicating that interpersonal transactional processes on all four levels of communication do influence the acquisition of the traditionally defined products of learning; e.g., knowledge, skill, attitude, habits, and values.

3. "Utilization of the levels of communication varies systematically with chronological age."

In the rationale underlying this study the term "level" of communication implies differentials in accumulative complexity of communication behavior associated with biosocial developmental processes. "The postulated levels can be used as a basis for setting up a categorical system under which the observed interpersonal communication behavior of a person may be subsumed. Such a categorical system makes it possible to observe and analyze systematically the communication development process, as well as the present individual's communication behavior" (Buehler and Richmond, 1965, Page 209). These postulates were the basis of Hypothesis No. 3 above.

Taken literally, this hypothesis could be interpreted as implying a development of communication behavior in terms of some self-actional variables, independent of the social cultural systems in which the organism has been implanted since birth. No such implications, however, are warranted. At the risk of repetitiveness or appearing to hedge on our data, it needs to be stated again that the observed behavior occurred in the social system of the school. Consequently, the data would appear to represent those biosocial behaviors which have either survived or have been acquired within the social cultural context of the subject's life and occur as the subject's communication adaptation to the immediate social system of the school. The term "biosocial" implies that behavior emerges and is controlled within and among biosocial systems, e.g., the family, the school, the vocational group, etc. Effort was made in the design of the study to control for social cultural background of the subjects (c.f. Chapter III, Paragraphs B and C above). Thus the data may be seen as representing the subjects' communication behavioral potentials as modified by the immediate social system of the school. Whether the primary adaptation factor is the student's adaptation to the social system of the school or the social system of the school adapting itself to the biosocially given behavior of the student is partially answered in terms of the former by the data which shows significant differences in the subjects' classroom as compared to nonclassroom behavior (c.f. Hypothesis 7 below).

When the correlation between age and use of the four primary levels of communication for all subjects in all observational situations was tested by the analysis of variance technique, the correlation was found to be significant at the $p. < .01$ level (c.f. Table 4 above). When the same analysis was made for age and categories, the correlation was significant at the same level (c.f. Table 5 above). Thus the data tends strongly to support the hypothesized correlation with reference to age and level of communication.

4. "There are significant differences between sexes in the utilization of levels of communication."

The combined data for all subjects in both observation situations do not show a significant difference between sexes in the use of the four communication levels and their eight categories. When a more refined analysis of data was made (c.f. Table 9, Page 54), sex differences become more visable, i.e. at different ages, the two sexes make different communication adaptations.

5. "Utilization of levels of communication does not correlate with intellectual ability, as measured by existing school records of intellectual ability."

A test of this hypothesis was not feasible within the limits of this study. The primary reason was that the school records on individual student's mental ability were not summarized in a manner which would permit comparative analysis. In many instances a student's test record would show an above-average I.Q. score on an individual test (WISC or WAIS) and average or lower scores on one or more group tests. In addition to the variety of instruments which were used by the schools to measure mental ability of an individual student or groups of students, the controls utilized by the schools in administering and scoring tests were not standardized. Consequently there were so many questions concerning the reliability of the existing records that it was considered improper to use these records to test hypothesis.

Consideration was given to obtaining mental ability measures as a part of the research, but this would have involved time and expense which was prohibitive within the boundaries of the study. Consequently, the hypothesis was not tested.

6. "Utilization of levels of communication correlates with academic achievement."

This hypothesis, like Hypothesis No. 5 above, was not tested for the reason that the school records on achievement did not provide a uniform basis for comparative analysis. Achievement tests to obtain data for this study were not possible within the time and budgetary limits of this study, consequently the hypothesis was not tested.

7. "The utilization of communication behavior on Levels 1 and II tends to be less frequent in formal educational situations (task oriented class situations) than in informal situations."

The design of the study provided a test of this hypothesis by comparing the situational affects upon interpersonal communication behavior. The subjects' communication behavior in the less teacher-controlled lunchroom situation may be seen as approximating their more "natural" interpersonal communication behavior, while classroom behavior under more formal instruction controls represents a greater adaptation of behavior to external demands. In this sense, communication behavior in the formal class situation constitutes the experimental data, and communication behavior in the less formal lunchroom constitutes the control data.

Figures 3 and 4 summarize the overall differences between nonclassroom and classroom behavior. The major differences are represented by a decrease in motor movement and a very marked increase in the use of technology in the class situation.

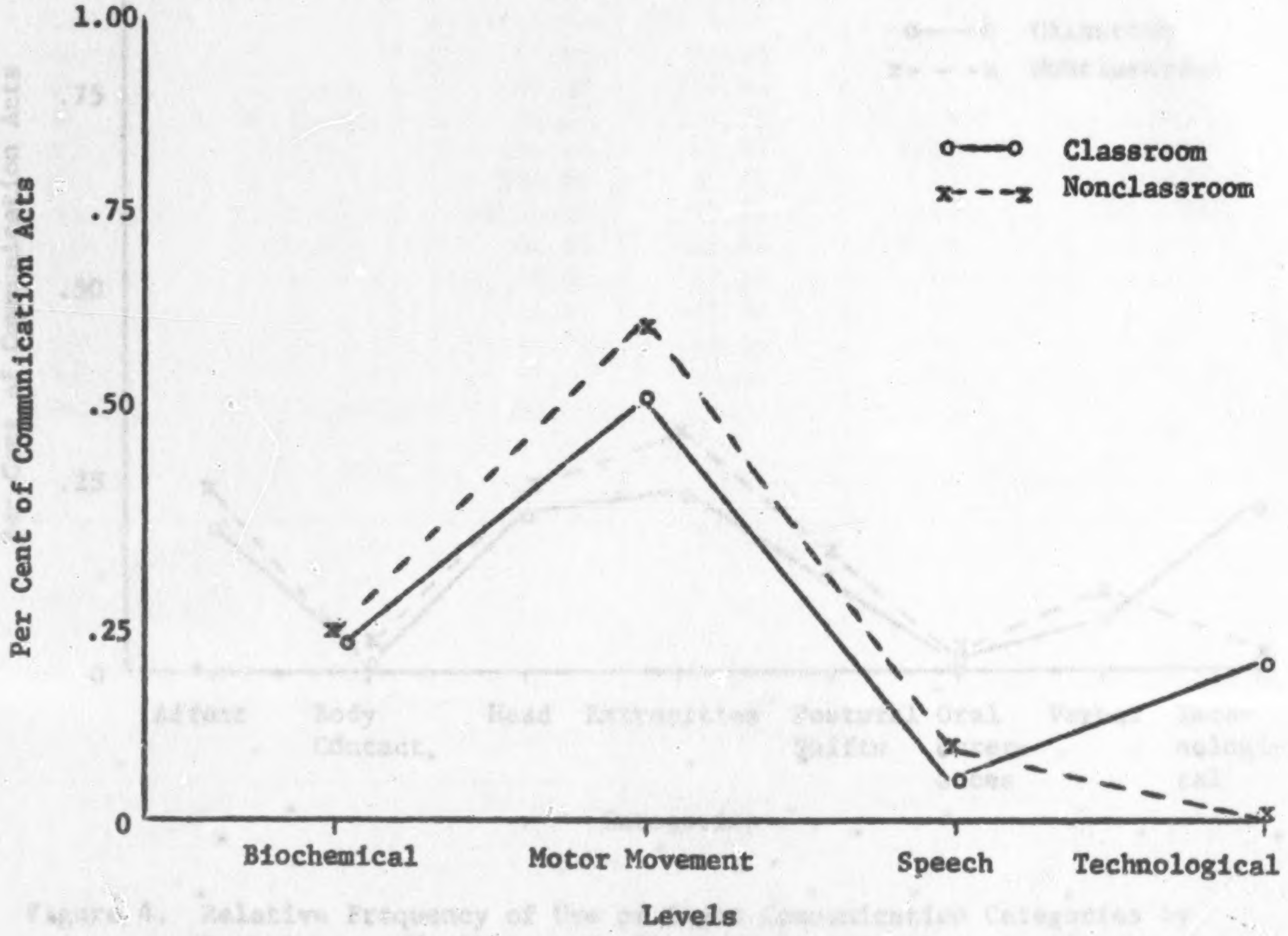

Figure 3. Relative Frequency of Use of Four Communication Levels by Both Sexes and All Ages in Classroom and Nonclassroom Situations.

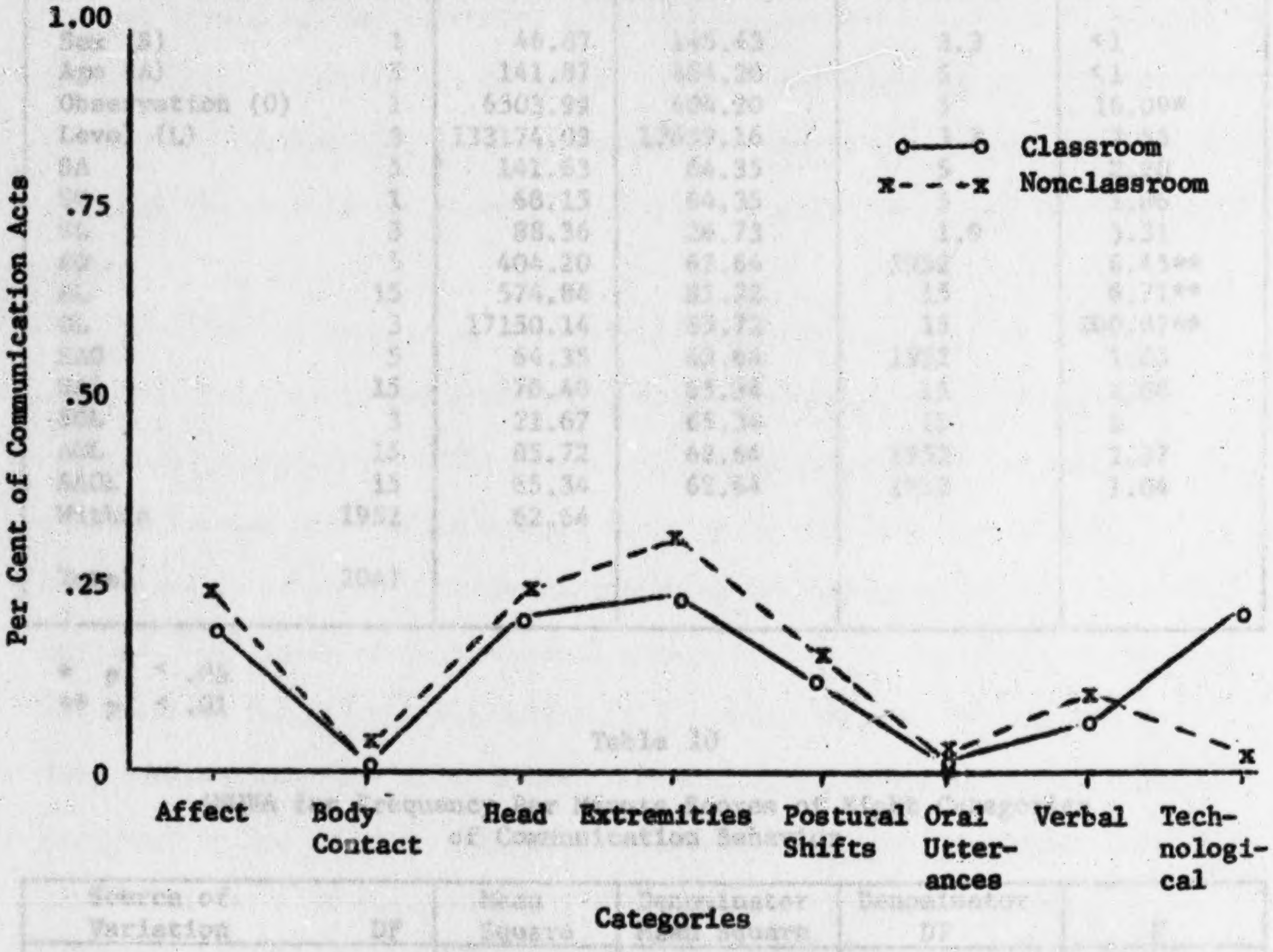

Figure 4. Relative Frequency of Use of Eight Communication Categories by Both Sexes and All Ages in Classroom and Nonclassroom Situations.

The significance of the differential effects of the two situations is revealed in the analysis of variance of frequency per minute scores for the four primary levels and the eight categories of communication. Summaries of these analyses are shown in Tables 9 and 10.[2]

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[2] Analyses presented in Tables 9 and 10 were completed utilizing techniques outlined by Green and Tukey (1960).

2

Table 9

ANOVA for Frequency Per Minute Scores for Four Communication Levels

Source of Variation	DF	Mean Square	Denominator Mean Square	Denominator DF	F
Sex (S)	1	46.87	145.43	3.3	<1
Age (A)	5	141.87	404.20	5	<1
Observation (0)	1	6503.99	404.20	5	16.09*
Level (L)	3	133174.03	17639.16	3.2	7.55
SA	5	141.63	64.35	5	2.20
SO	1	68.15	64.35	5	1.06
SL	3	88.36	26.73	1.9	3.31
AO	5	404.20	62.64	1952	6.45**
AL	15	574.84	85.72	15	6.71**
OL	3	17150.14	85.72	15	200.07**
SAO	5	64.35	62.64	1952	1.03
SAL	15	70.40	65.34	15	1.08
SOL	3	21.67	65.34	15	1
AOL	15	85.72	62.64	1952	1.37
SAOL	15	65.34	62.64	1952	1.04
Within	1952	62.64			
Total	2047				

* p. < .05

** p. < .01

Table 10

ANOVA for Frequency Per Minute Scores of Eight Categories of Communication Behavior

Source of Variation	DF	Mean Square	Denominator Mean Square	Denominator DF	F
Sex (S)	1	23.44	72.71	1.9	< 1
Age (A)	5	70.94	202.10	5	< 1
Observation (0)	1	3251.99	202.10	5	16.09*
Category (C)	7	22458.16	4890.21	7.3	4.59*
SA	5	70.81	32.18	5	2.20
SO	1	34.08	32.18	5	1.06
SC	7	22.28	22.50	5.6	1
AO	5	202.10	23.28	3904	8.68**
AC	35	157.31	54.12	35	2.91**
OC	7	4787.02	54.12	35	88.45**
SAO	5	32.18	23.28	3904	1.38
SAC	35	41.06	21.97	35	1.87*
SOC	7	3.41	21.97	35	1
AOC	35	54.12	23.28	3904	2.32**
SAOC	35	21.97	23.28	3904	1
Within	3904	23.28			
Total	4095				

* p. < .05

** p. < .01

The above tables indicate that situation correlates with both level and category of communication at the p. < .01 level of significance. Furthermore there are significant correlations (p. < .01 level) between situation and age, age and level, age and category, observational situation and level, as well as observational situation and category. It is interesting to note too that the correlation between age, sex, and category is significant at the p. < .01 level although the correlation between sex, age, situation and level is not significant.

Thus, it can be said very definitely that the distribution of behavior among the four levels and eight categories of communication changes from classroom to nonclassroom situations. The nonclassroom setting with its reduced control elicited an overall increase in the frequency of all communication behavior with the exception of technology which was practically unused. The nonuse of technological communications in the nonclass situation was observed for all subjects within the sample. Of the 256 subjects for whom observations were made in both situations, 27% revealed no decrease in frequency in any behavior from classroom to nonclassroom settings. Less than 20% of all pairs of observations (7 Behaviors X 256 Subjects) revealed a decrease from classroom to nonclassroom situation. In short, the formal instructional methodology in the classroom requires a significant restriction of all communication except the use of the technological extensions of verbal symbols.

A different analysis of the effects of situation upon behavior is summarized in Figure 5. This figure shows the distribution of interpersonal communication behavior among the four levels of communication from age 5 through 17.

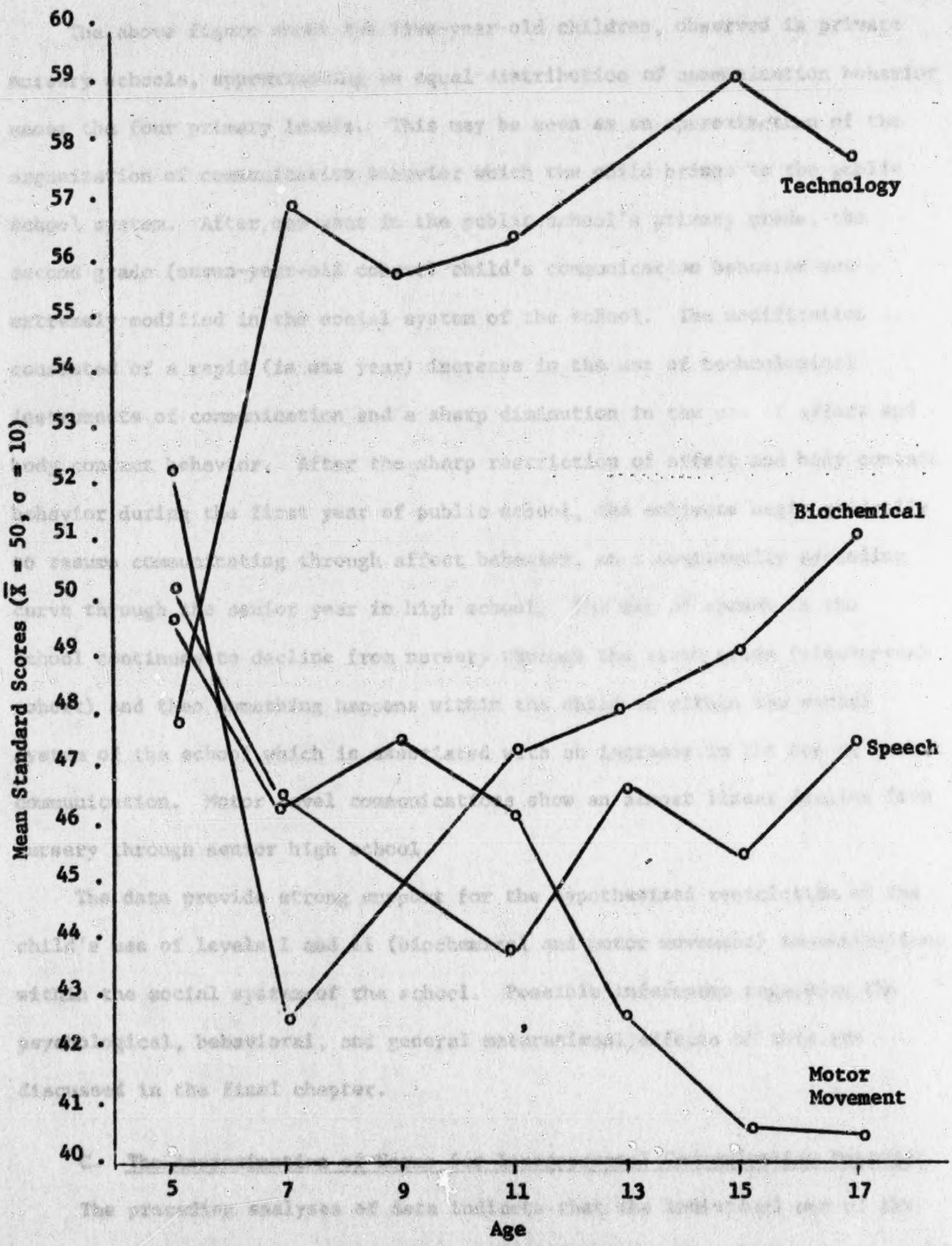

Figure 5. Differences in Use of Levels of Communication, Both Sexes, Both Situations, Across Ages

The above figure shows the five-year-old children, observed in private nursery schools, approximating an equal distribution of communication behavior among the four primary levels. This may be seen as an approximation of the organization of communication behavior which the child brings to the public school system. After one year in the public school's primary grade, the second grade (seven-year-old cohort) child's communication behavior was extremely modified in the social system of the school. The modification consisted of a rapid (in one year) increase in the use of technological instruments of communication and a sharp diminution in the use of affect and body contact behavior. After the sharp restriction of affect and body contact behavior during the first year of public school, the subjects begin gradually to resume communicating through affect behavior, on a continually ascending curve through the senior year in high school. The use of speech in the school continues to decline from nursery through the sixth grade (eleven-year cohort) and then something happens within the child or within the social system of the school which is associated with an increase in the use of verbal communication. Motor level communications show an almost linear decline from nursery through senior high school.

The data provide strong support for the hypothesized restriction of the child's use of levels I and II (biochemical and motor movement) communications within the social system of the school. Possible inferences regarding the psychological, behavioral, and general maturational effects of this are discussed in the final chapter.

C. The Approximation of Norms for Interpersonal Communication Behavior

The preceding analyses of data indicate that the individual use of the four primary levels of communication is significantly related to age, sex, and social situation. The hypothesized differentials in interpersonal communication behavior thus tend to be validated by direct observations of behavior.

In this section the mean ratio of behavior per level and category is presented as tentative approximations of norms with reference to age, sex and situation. These presentations may serve as a basis for replication and further validation in other situations and on other subjects. The term "tentative approximation" is emphasized at this time.

Two depictions of the data are given. The first, Table 11, shows the mean ratio of communication behavior in each level and category for boys and for girls in each age cohort in classroom situations. The second depiction, Table 12, shows the mean ratio of communication behavior in each level and category for both sexes in each age cohort in nonclass (lunchroom) situations.

Table 11.1

Distribution of Communication Behavior in Classroom Situations by Age and Sex

Age		Levels							
		Biochemical		Motor Movement		Speech		Technology	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
5	$\overline{X}$	23.6	24.5	62.4	61.6	7.2	6.6	6.8	7.3
	σ	7.6	7.0	6.3	10.4	4.5	3.5	8.5	8.2
7	$\overline{X}$	18.7	16.2	57.9	53.5	4.8	5.8	18.6	24.5
	σ	5.3	4.5	8.5	11.0	4.0	3.9	8.8	11.6
9	$\overline{X}$	19.9	19.0	57.6	57.1	3.6	4.8	18.9	19.0
	σ	7.1	8.0	7.2	9.8	3.9	4.6	9.0	13.0
11	$\overline{X}$	21.5	19.3	54.5	56.6	2.5	4.2	21.5	19.8
	σ	7.5	4.2	14.9	7.5	1.6	4.1	14.8	9.6
13	$\overline{X}$	22.2	20.7	51.4	50.4	5.4	5.1	20.9	23.8
	σ	7.2	7.4	10.9	12.9	4.5	4.8	14.9	16.2
15	$\overline{X}$	19.8	23.7	53.2	44.7	3.9	4.4	23.1	27.2
	σ	6.4	7.8	13.7	8.7	3.4	3.9	14.2	13.3
17	$\overline{X}$	21.4	25.5	47.3	49.7	5.7	6.1	25.6	18.6
	σ	5.7	7.1	9.7	9.7	5.6	5.0	13.5	11.1

Table 11.2

Distribution of Communication Behavior in Classroom Situations by Age and Sex

Categories

Age		Affect		Body Contact		Extremities		Head		Posture		Oral Sound		Verbal		Technology	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
5	$\overline{X}$	20.6	22.8	2.9	1.6	22.1	24.1	24.8	24.5	15.6	13.0	1.1	.8	6.1	5.8	6.8	7.3
	σ	5.9	6.2	3.2	2.7	4.9	5.1	4.8	7.3	5.8	6.4	1.4	2.6	4.0	3.5	8.5	8.2
7	$\overline{X}$	17.9	15.8	.8	.4	22.0	20.5	22.2	20.3	13.7	12.8	.1	.0	4.6	5.7	18.6	24.5
	σ	5.2	4.5	1.2	.7	5.9	5.3	6.3	7.0	5.3	5.3	.4	.1	3.9	3.9	8.8	11.6
9	$\overline{X}$	19.7	18.7	.2	.4	21.0	22.5	24.2	21.1	12.4	13.5	.1	.0	3.5	4.8	18.9	19.0
	σ	7.0	8.1	.2	.6	5.5	5.2	4.9	6.4	5.7	6.3	.2	.0	3.9	4.6	9.0	13.0
11	$\overline{X}$	21.4	18.8	.1	.5	21.5	20.0	21.9	25.8	11.1	10.8	.0	.0	2.5	4.2	21.5	19.8
	σ	7.6	4.0	.2	.9	8.9	5.0	7.5	5.6	4.8	5.7	.0	.1	1.6	4.1	14.8	9.6
13	$\overline{X}$	21.2	20.4	1.0	.3	12.8	18.6	24.8	22.9	8.8	8.9	.1	.0	5.4	5.1	20.9	23.8
	σ	6.6	7.5	2.1	.5	5.8	7.1	7.4	7.4	5.0	4.9	.1	.1	4.5	4.7	14.9	16.2
15	$\overline{X}$	19.3	23.6	.4	.1	22.0	16.2	24.1	22.1	7.1	6.4	.0	.0	3.8	4.4	23.1	27.2
	σ	6.1	7.7	.6	.1	10.9	4.9	5.8	7.3	4.2	3.7	.0	.1	3.4	3.9	14.2	13.3
17	$\overline{X}$	21.1	25.3	.2	.3	22.0	17.5	19.0	27.1	6.3	5.1	.1	.1	5.6	6.0	25.6	18.6
	σ	5.9	7.2	.5	.5	7.5	8.0	7.1	5.6	4.6	3.8	.5	.1	5.3	5.0	13.5	11.1

Table 12.1

Distribution of Communication Behavior in Nonclassroom Situations by Age and Sex

Age		Levels							
		Biochemical		Motor Movement		Speech		Technology	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
7	$\overline{X}$	24.1	20.5	71.9	74.4	3.9	5.0	.1	.0
	σ	7.8	7.5	8.5	8.6	4.1	6.1	.4	.0
9	$\overline{X}$	23.9	22.8	70.7	71.5	5.3	5.2	.1	.5
	σ	7.6	7.1	10.2	8.0	4.1	4.7	.2	1.4
11	$\overline{X}$	25.0	24.8	71.0	66.8	3.9	8.2	.1	.1
	σ	6.7	7.7	9.3	8.0	4.2	7.6	.3	.3
13	$\overline{X}$	25.7	23.9	63.6	61.1	10.0	13.7	.7	1.3
	σ	6.4	6.9	8.0	7.1	4.9	5.2	1.7	5.3
15	$\overline{X}$	23.7	25.9	60.6	57.2	13.2	14.6	2.4	2.2
	σ	6.9	4.4	8.2	7.2	8.3	5.5	7.3	5.6
17	$\overline{X}$	23.2	25.5	56.8	55.3	18.2	15.7	1.8	3.5
	σ	4.9	6.0	6.2	5.2	8.4	5.0	4.9	10.6

Table 12.2

Distribution of Communication Behavior in Nonclassroom Situations by Age and Sex

Age		Affect		Body Contact		Extremeities		Head		Posture		Oral Sound		Verbal		Technology	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
7	$\overline{X}$	22.7	19.4	1.4	1.2	25.3	26.9	31.1	29.5	15.5	18.1	.3	.1	3.6	4.9	.1	.0
	σ	7.6	7.7	2.0	1.6	5.3	7.0	5.4	5.3	7.9	5.3	.6	.2	3.9	6.1	.4	.0
9	$\overline{X}$	22.6	20.8	1.3	2.0	21.9	24.1	32.0	30.2	16.8	17.2	.2	.0	5.2	5.2	.1	.5
	σ	7.2	7.4	1.6	2.5	9.5	8.3	8.7	5.8	8.0	8.3	.4	.0	4.0	4.7	.2	1.4
11	$\overline{X}$	23.9	23.4	1.1	1.4	22.8	20.8	32.5	32.1	15.7	13.9	.1	.1	3.7	8.1	.1	.1
	σ	6.4	7.4	1.7	2.0	7.3	6.7	7.5	7.2	6.2	6.7	.4	.2	3.9	7.6	.3	.3
13	$\overline{X}$	24.7	23.5	1.0	.4	20.6	20.1	28.1	28.5	14.9	12.4	.2	.0	9.8	13.7	.7	1.3
	σ	6.1	6.8	1.8	.7	5.9	4.5	6.0	5.1	6.8	7.1	.4	.1	4.7	5.1	1.7	5.3
15	$\overline{X}$	23.3	25.8	.4	.2	22.0	18.7	29.3	30.1	9.3	8.5	.0	.1	13.2	14.5	2.4	2.2
	σ	6.8	4.5	.7	.4	8.3	7.0	5.9	6.4	4.3	4.7	.1	.2	8.4	5.6	7.3	5.6
17	$\overline{X}$	23.1	25.5	.1	.0	22.2	17.8	24.3	27.2	10.2	10.4	.1	.1	18.0	15.6	1.8	3.5
	σ	5.0	6.0	.3	.1	7.1	6.0	5.8	4.9	6.6	5.7	.5	.3	8.4	5.0	4.9	10.6

The data summarized in Tables 11 and 12 appear more graphically in the following figures which highlight the differences with reference to age, sex and situation.

Figures 6.1 - 6.8

Differences in Use of Levels of Communication, Boys and Girls, Classroom and Nonclassroom Situations

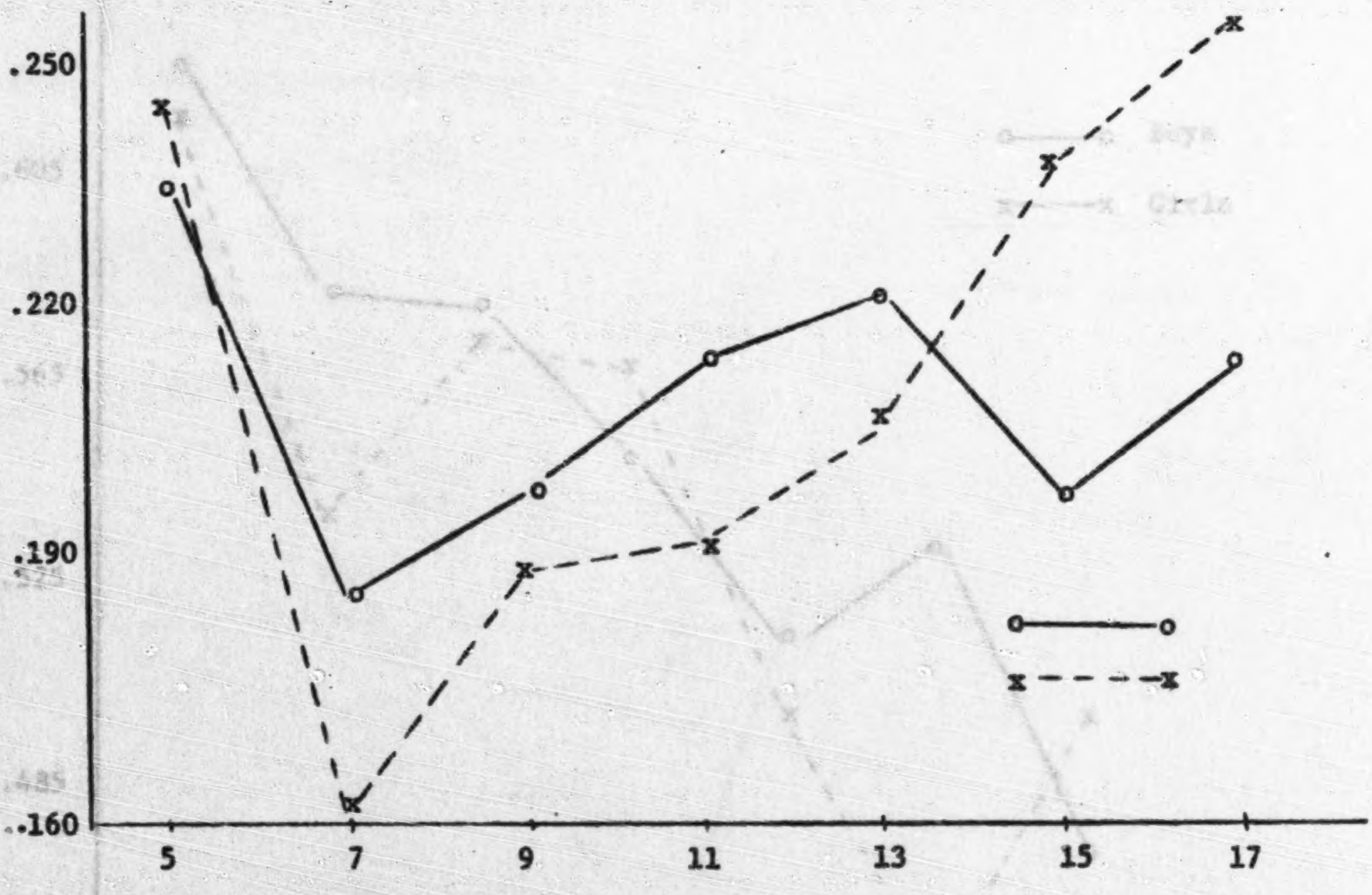

Figure 6.1 Biochemical Classroom

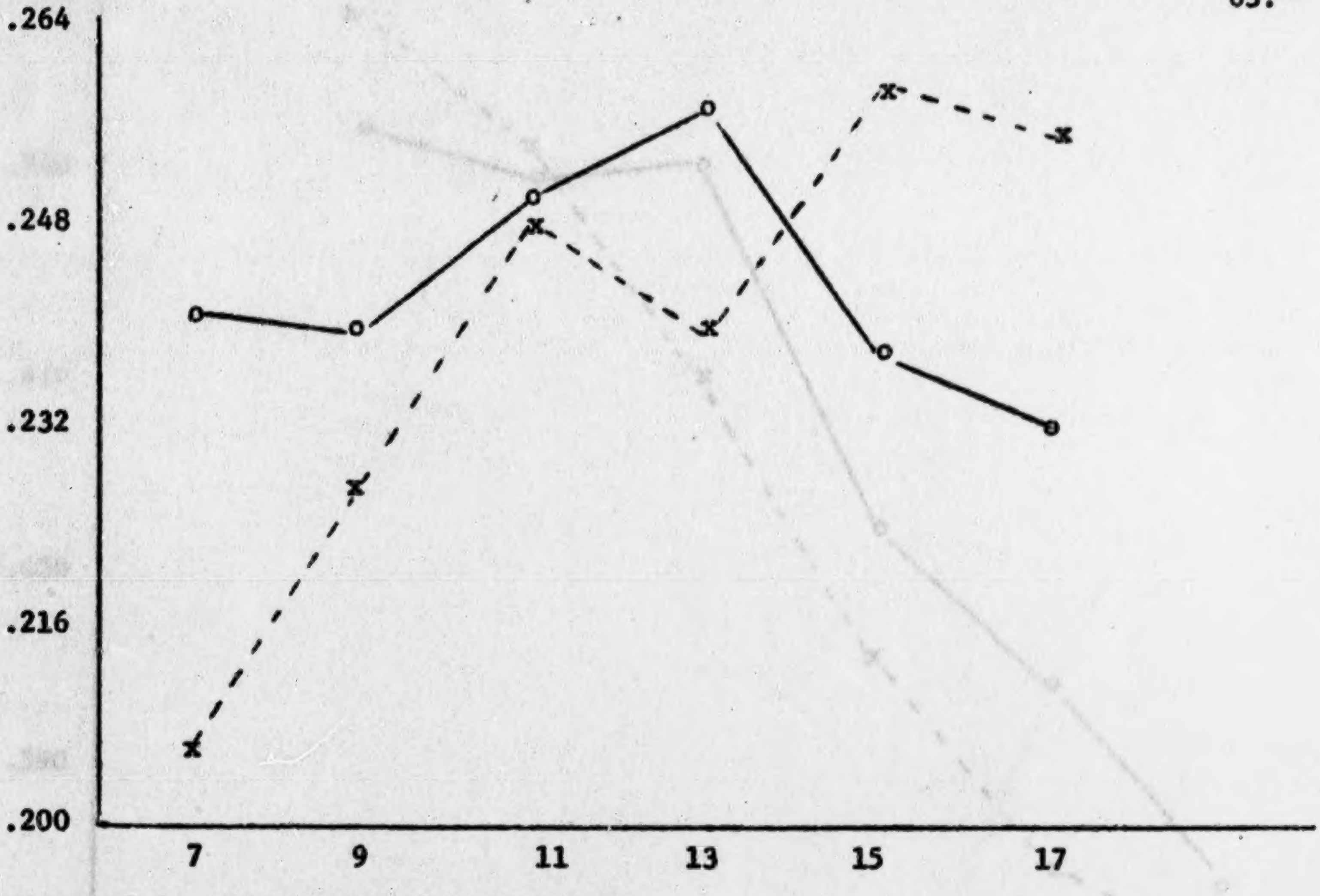

Figure 6.2 Biochemical Nonclassroom

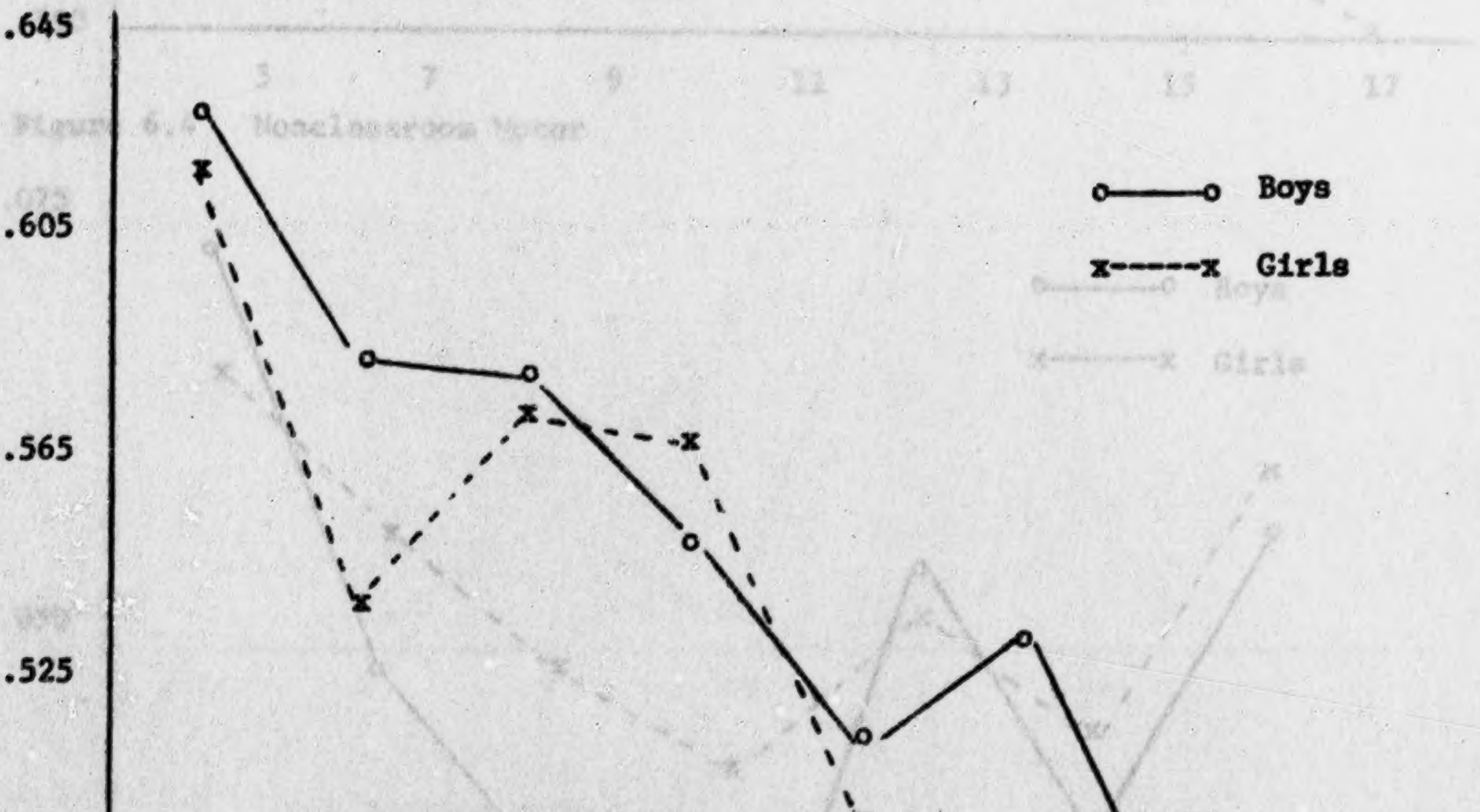

Figure 6.3 Motor in Classroom

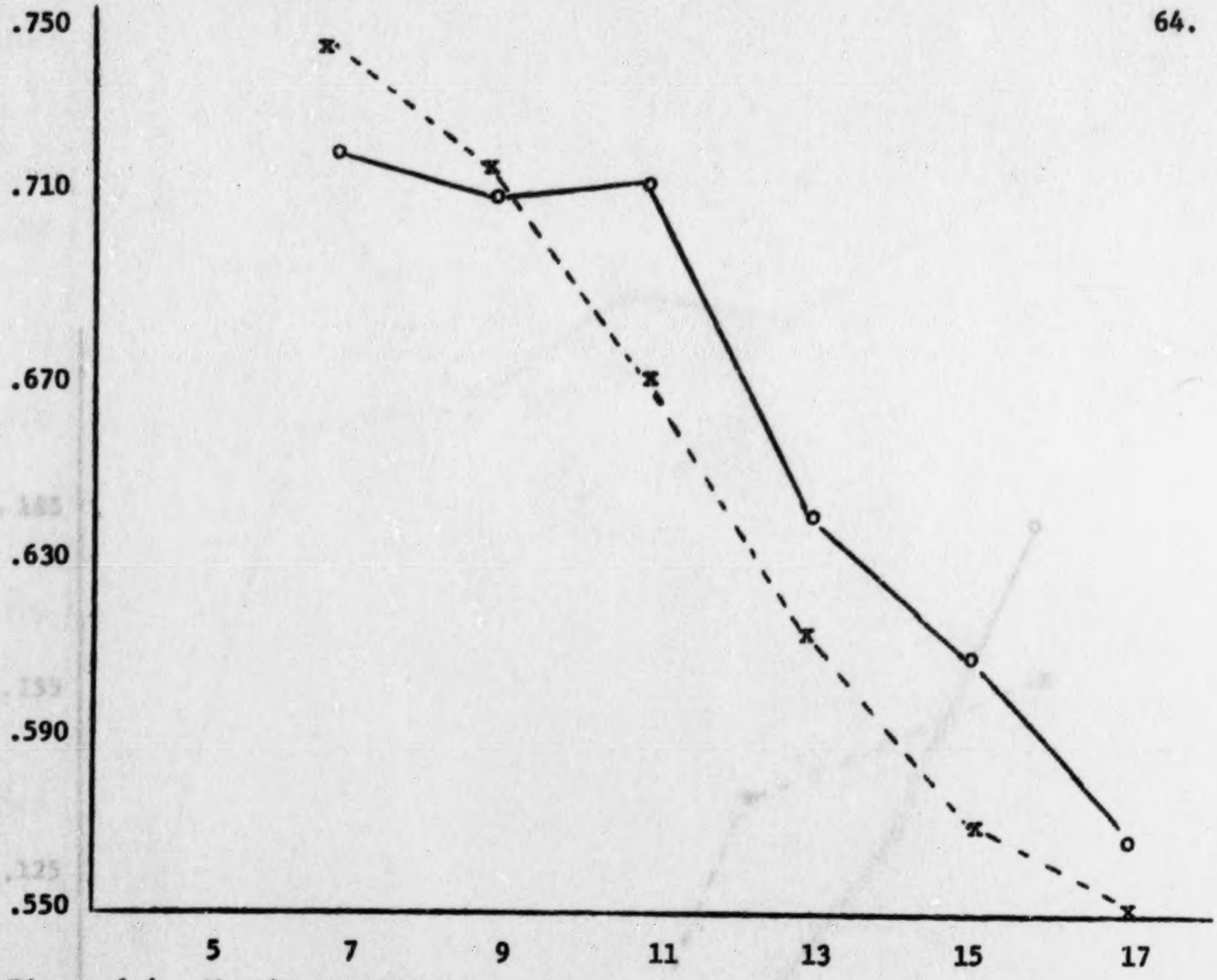

Figure 6.4 Nonclassroom Motor

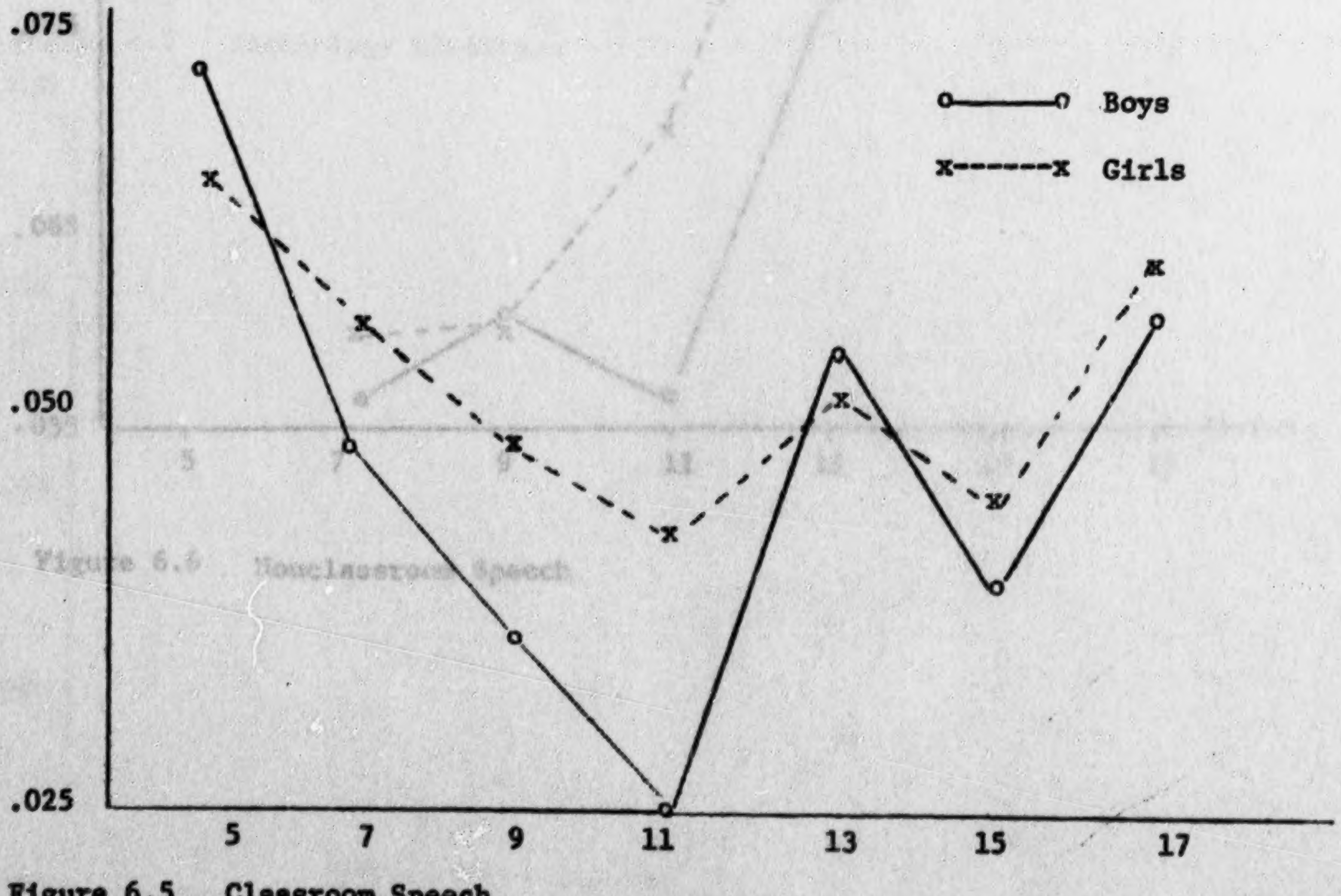

Figure 6.5 Classroom Speech

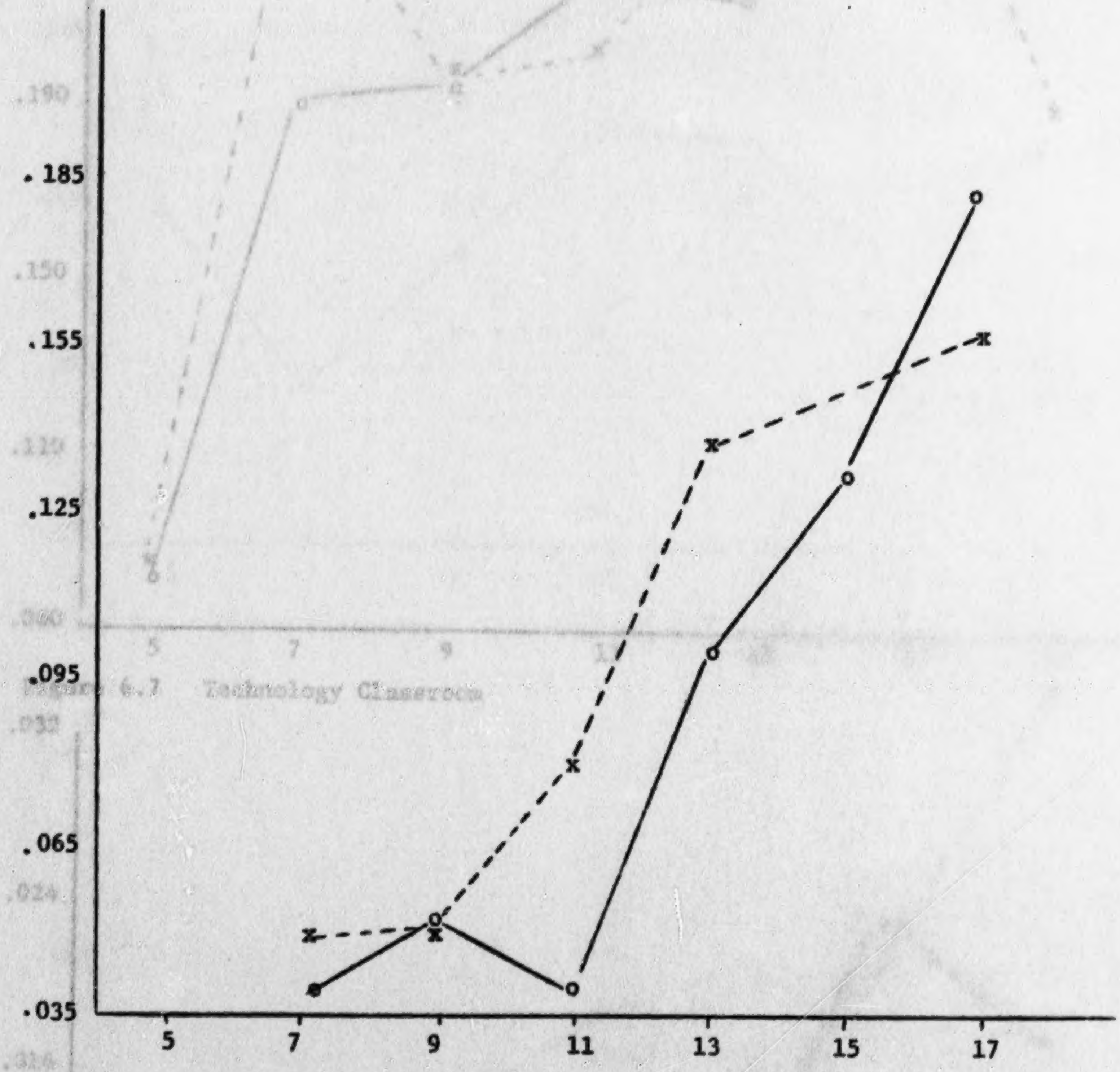

Figure 6.6 Nonclassroom Speech

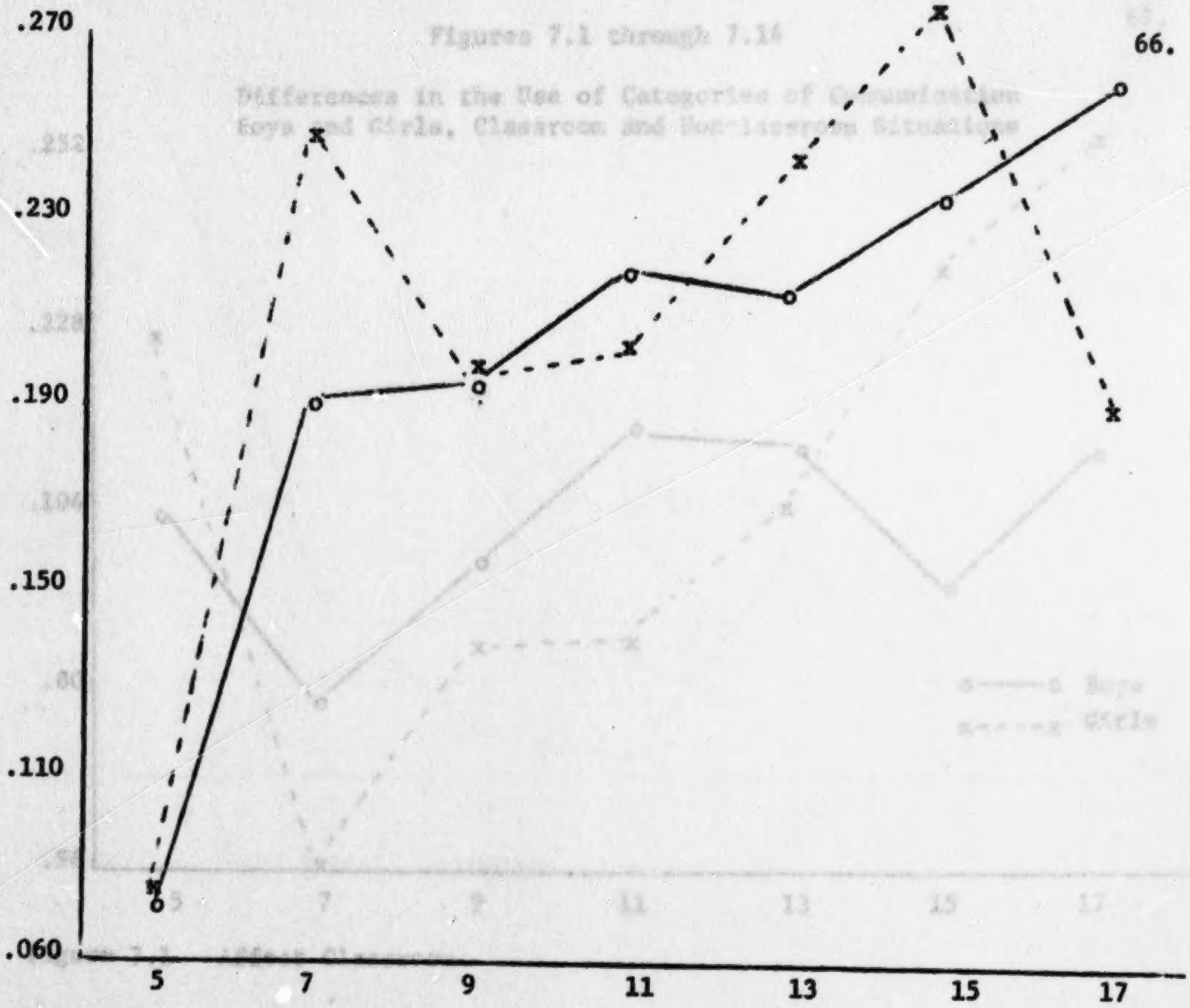

Figure 6.7 Technology Classroom

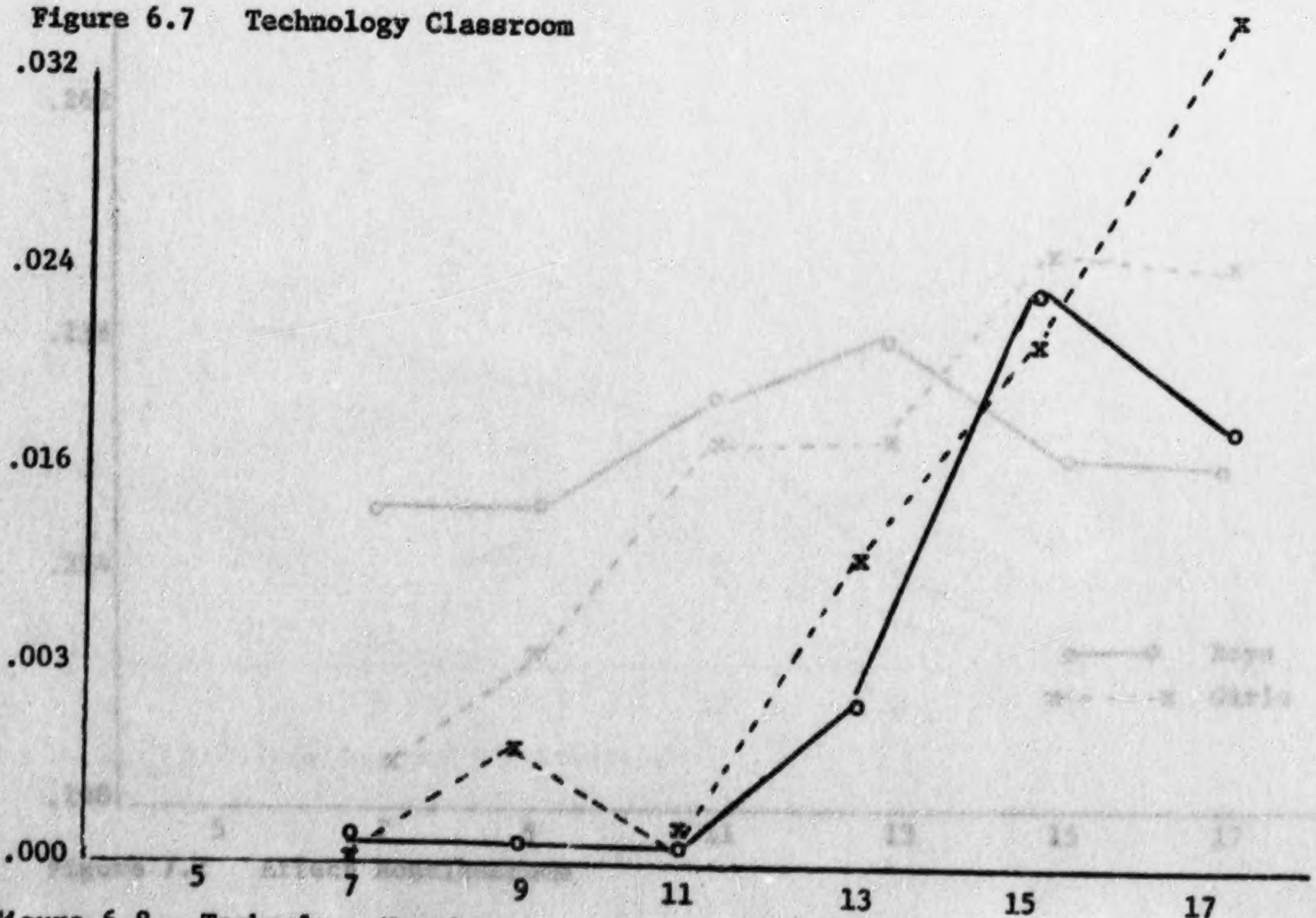

Figure 6.8 Technology Non

Figures 7.1 through 7.14

Differences in the Use of Categories of Communication Boys and Girls, Classroom and Nonclassroom Situations

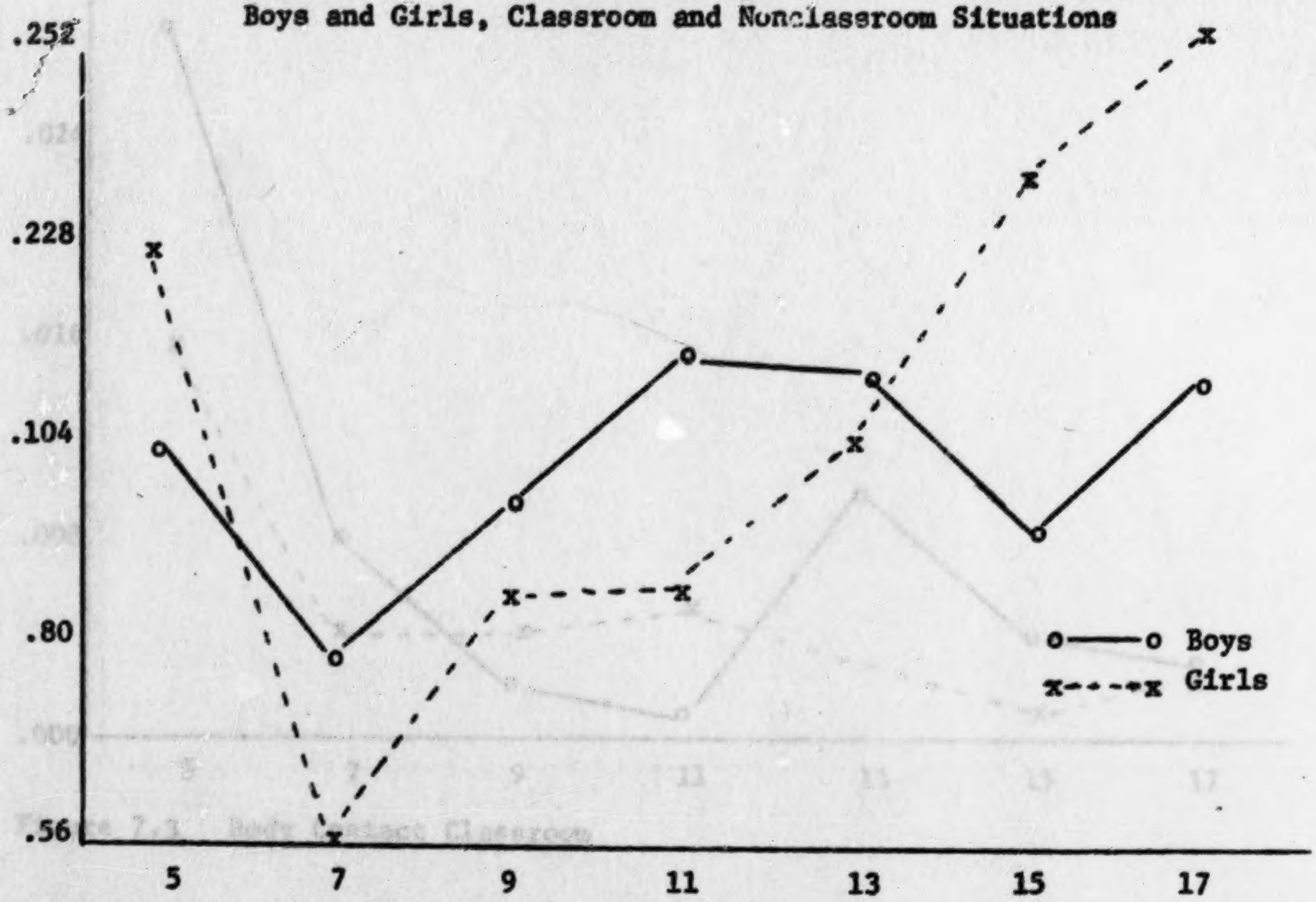

Figure 7.1 Affect Classroom

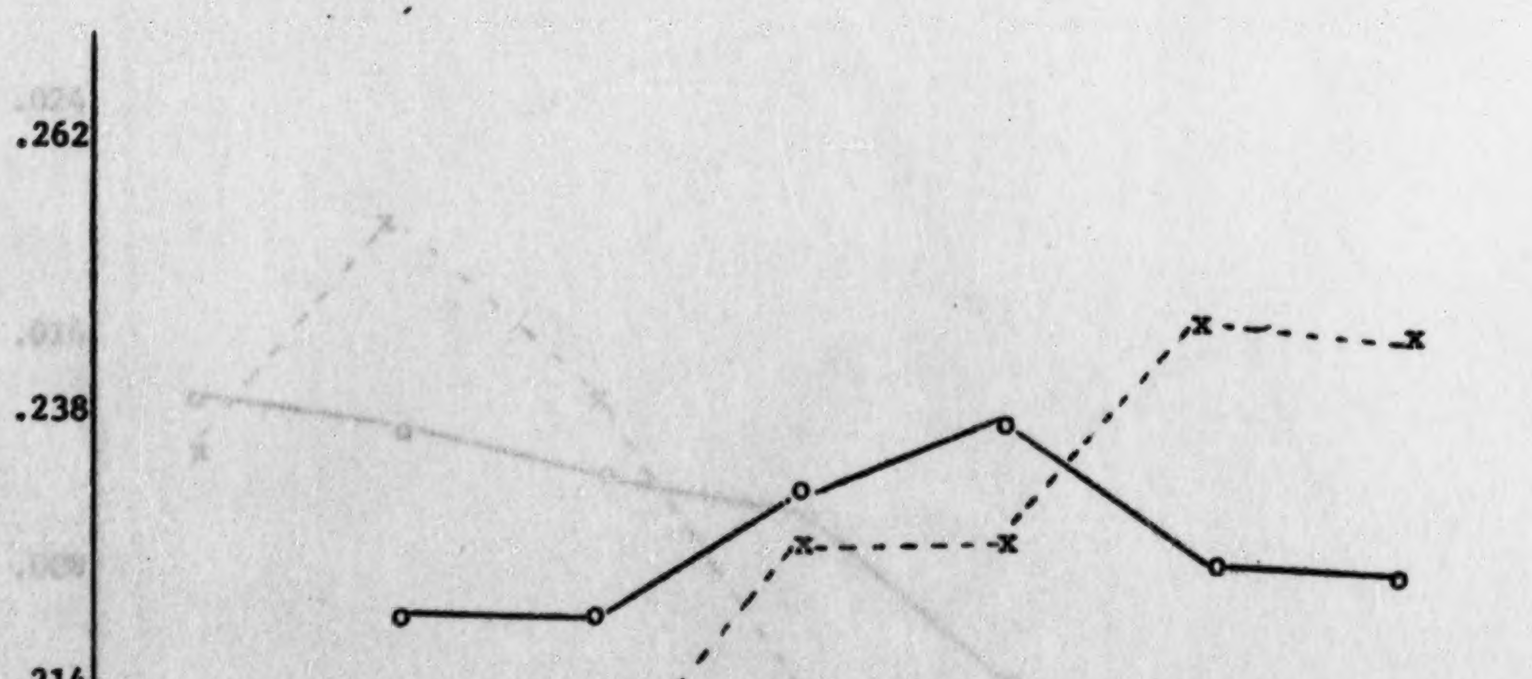

Figure 7.2 Affect Nonclassroom

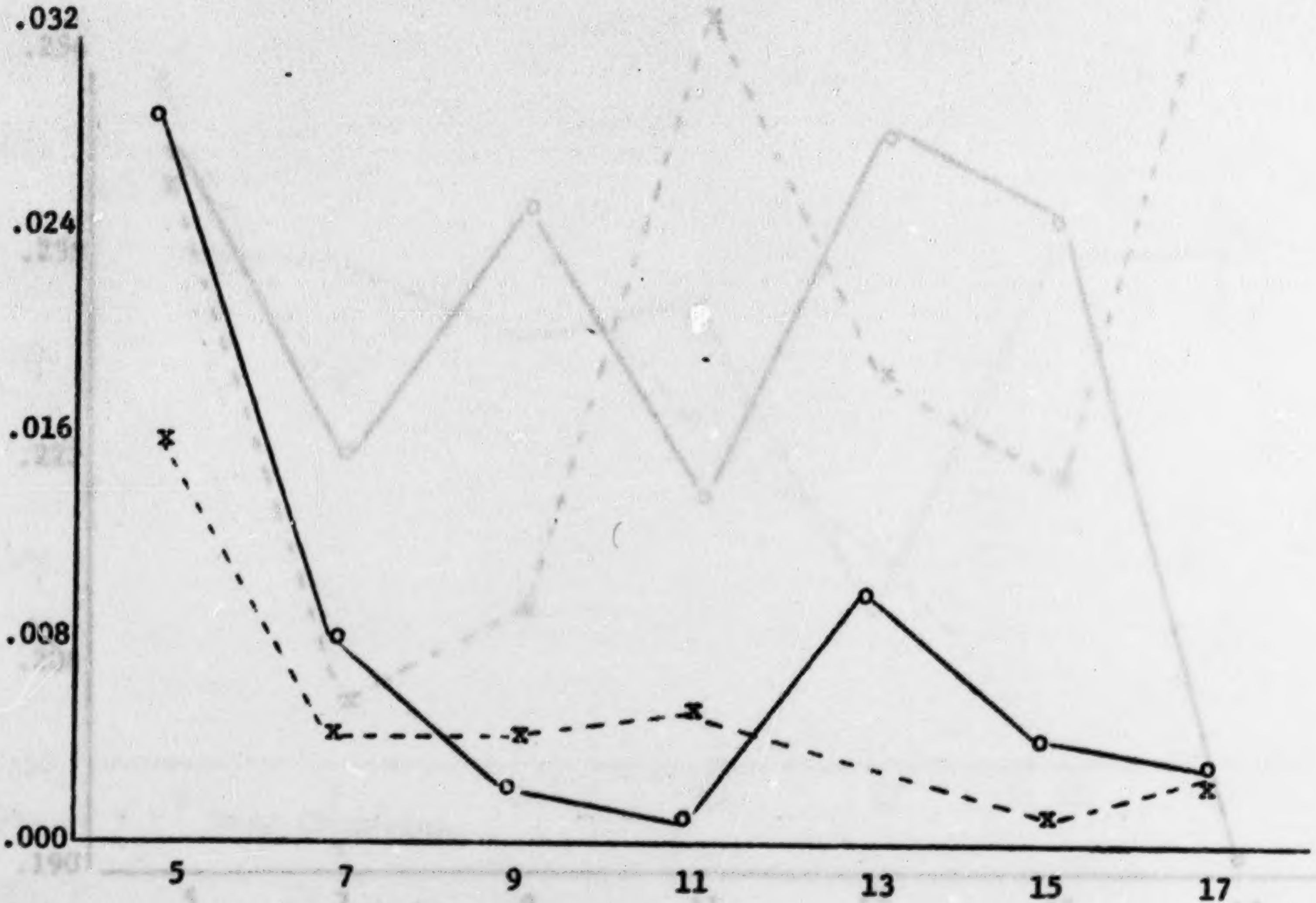

Figure 7.3 Body Contact Classroom

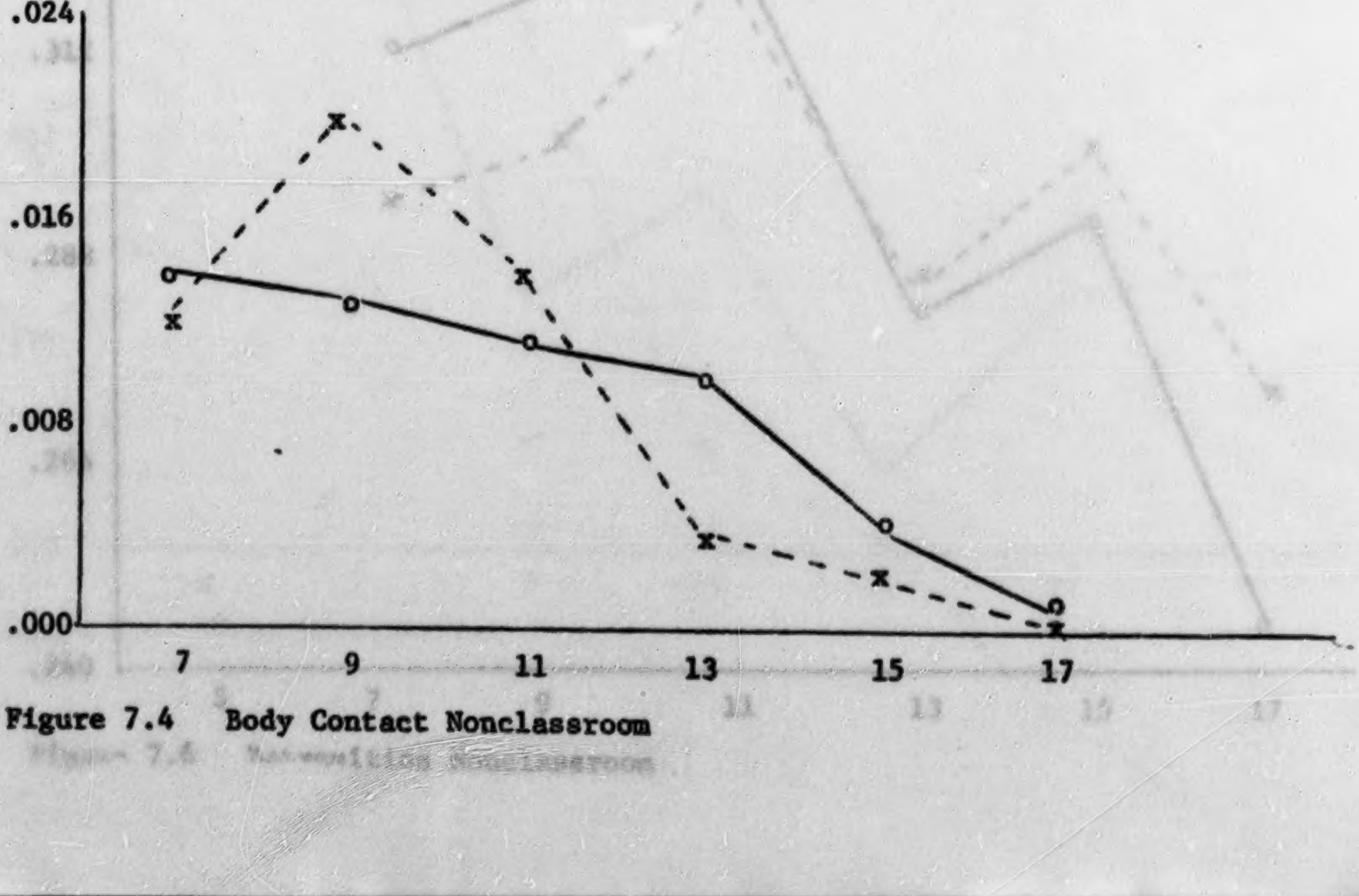

Figure 7.4 Body Contact Nonclassroom

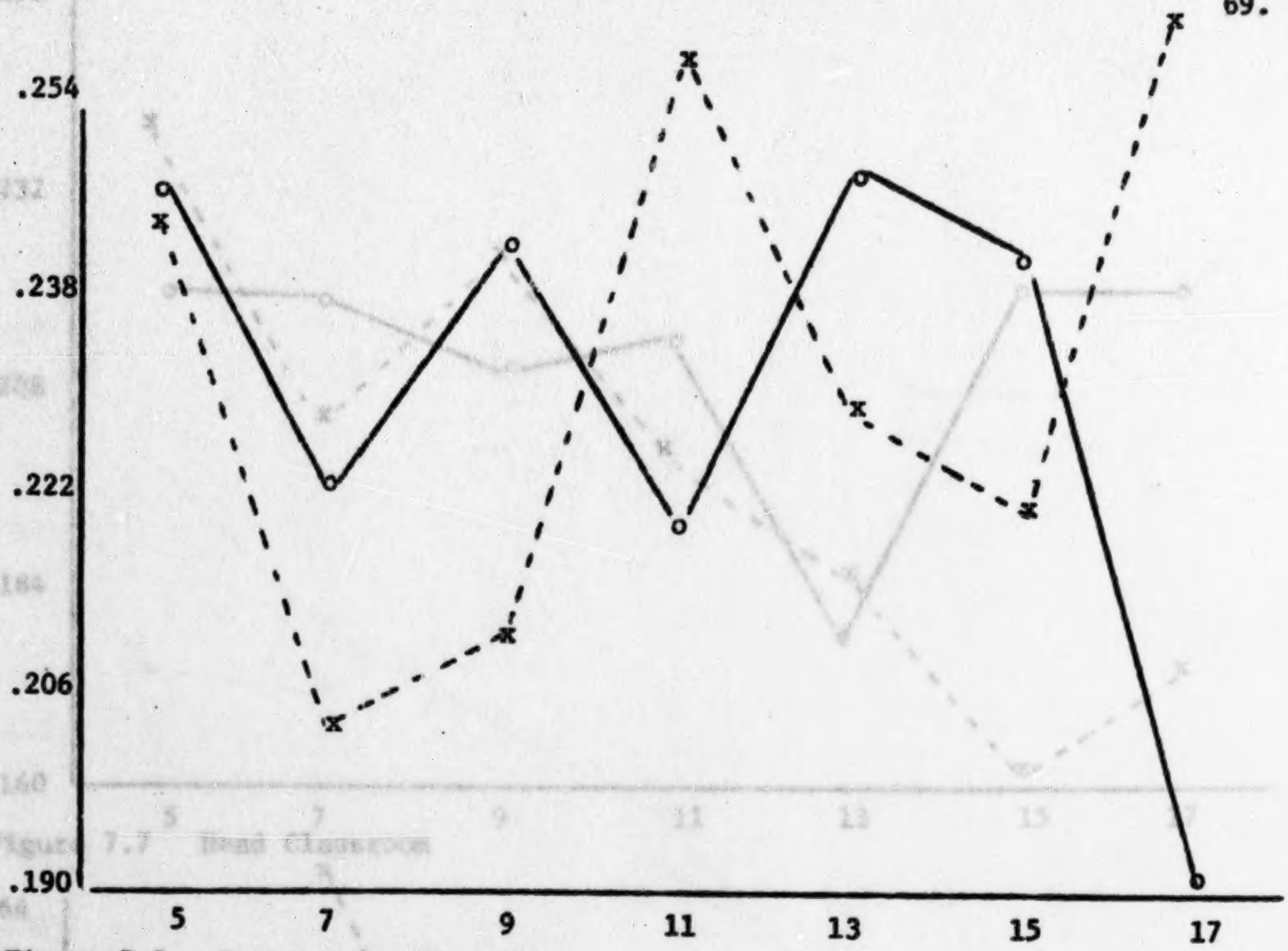

Figure 7.5 Extremities Classroom

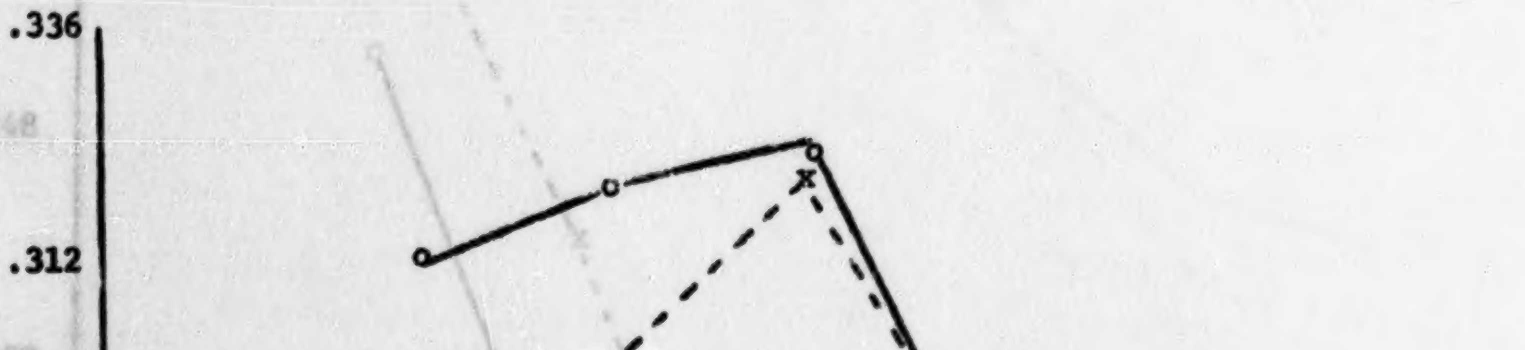

Figure 7.6 Extremities Nonclassroom

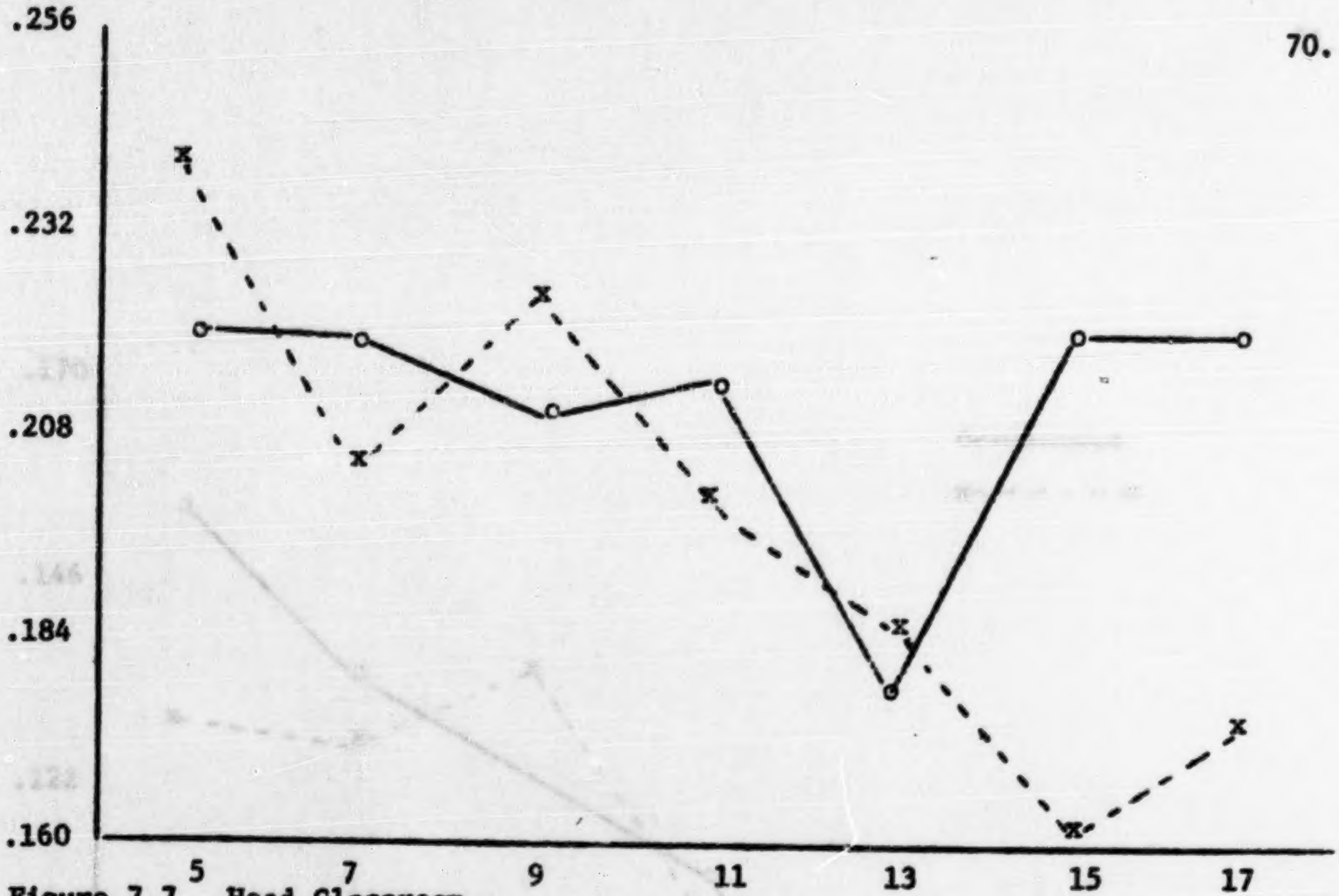

Figure 7.7 Head Classroom

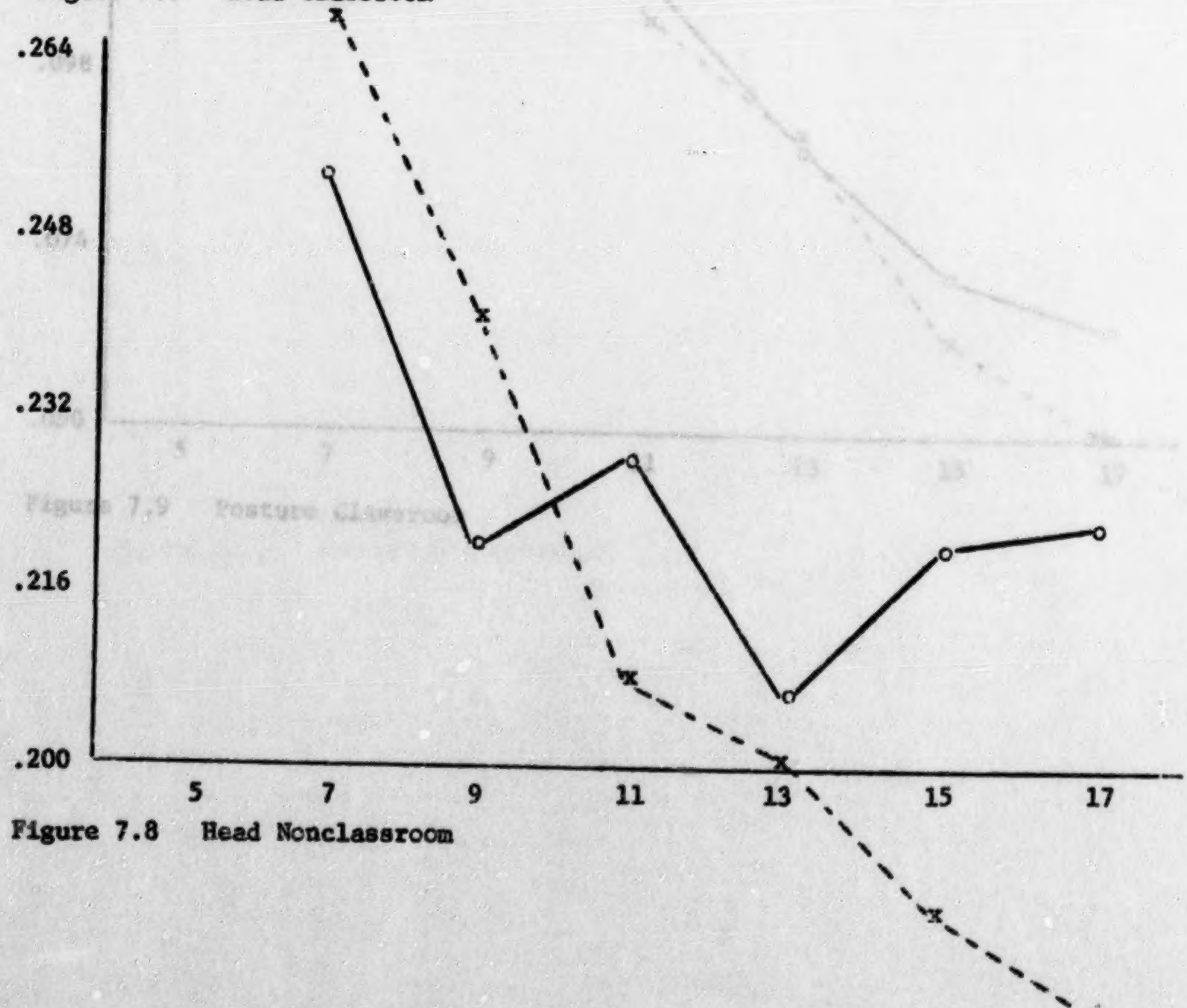

Figure 7.8 Head Nonclassroom

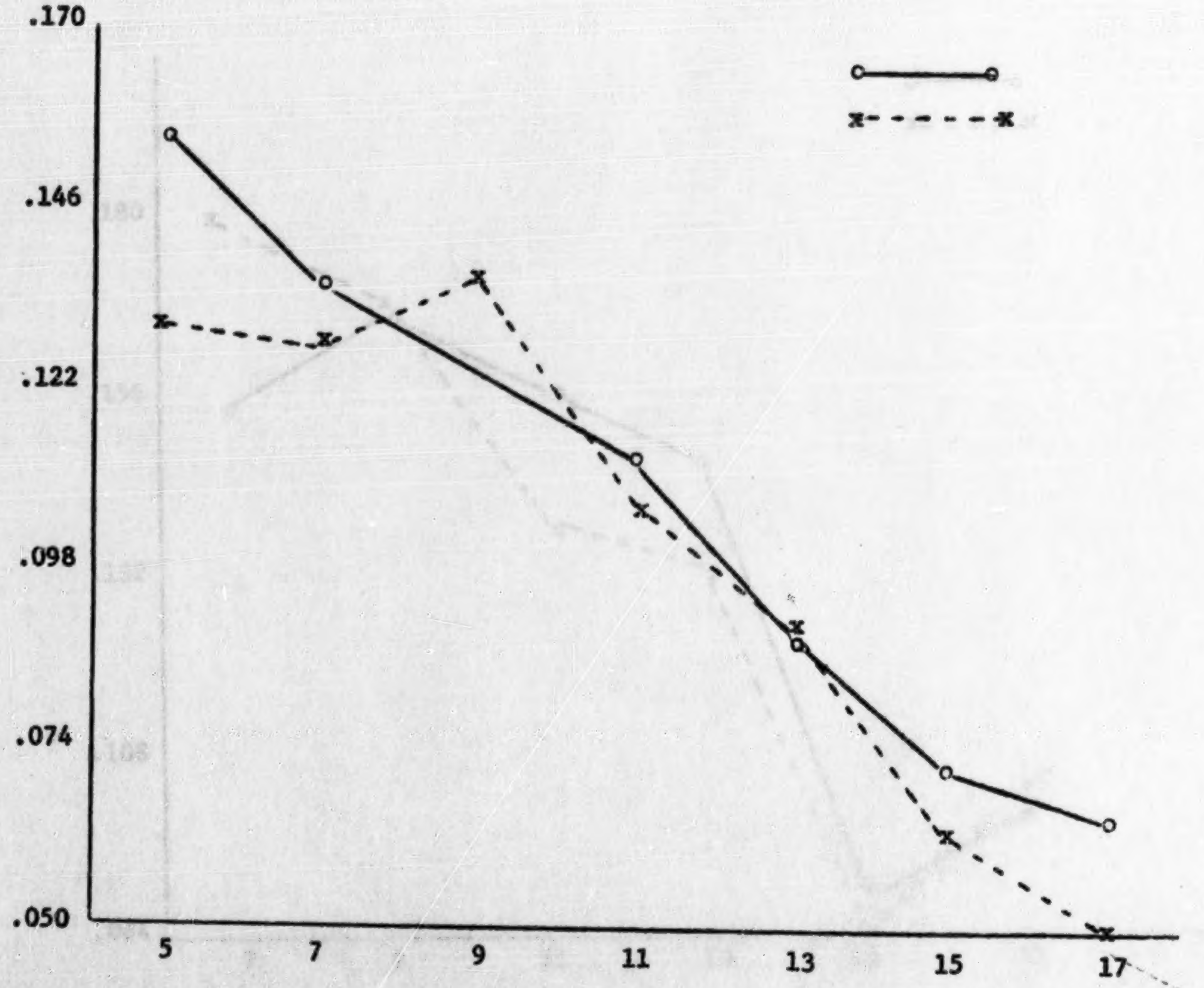

Figure 7.9 Posture Classroom

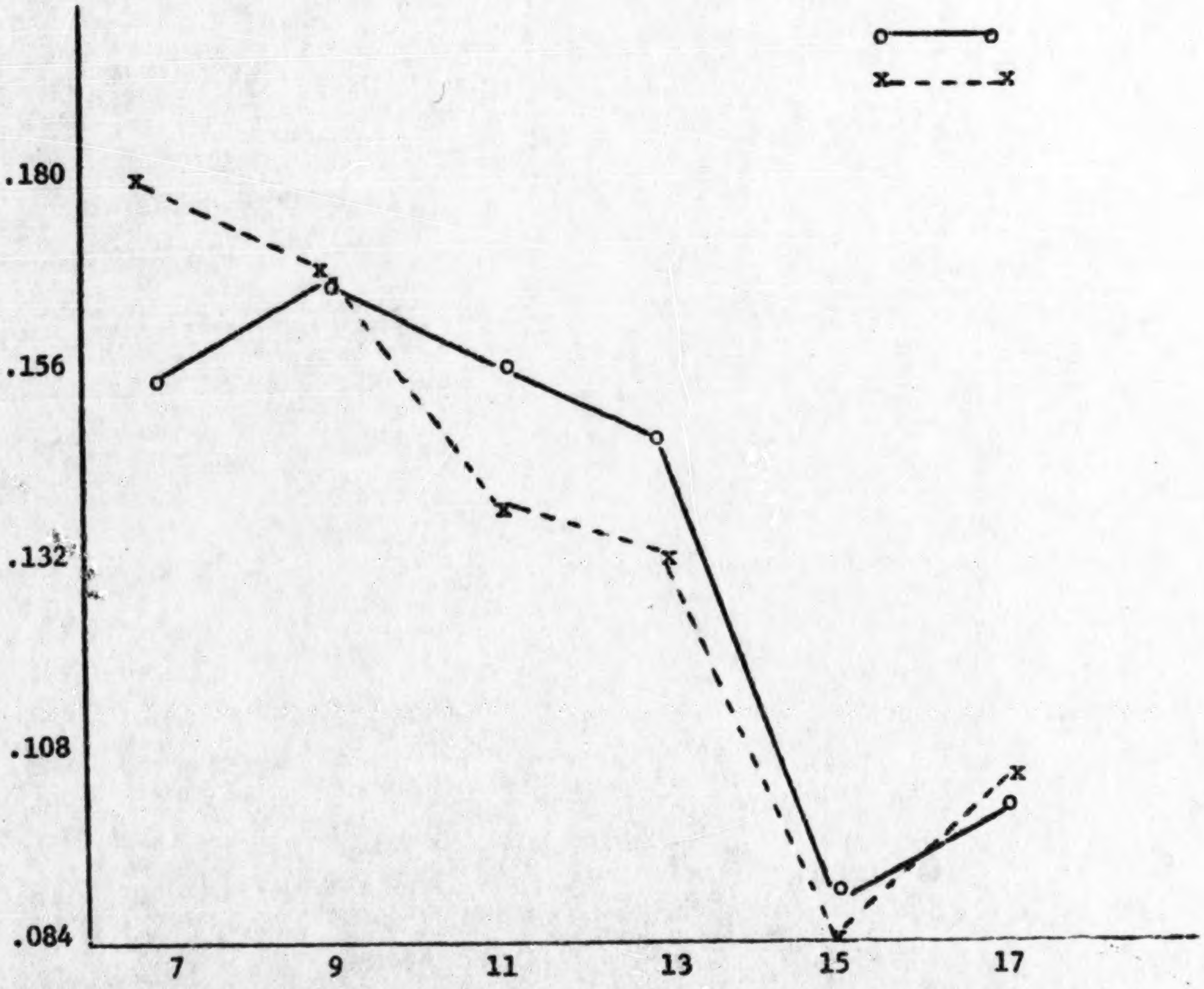

Figure 7.10 Posture Nonclassroom

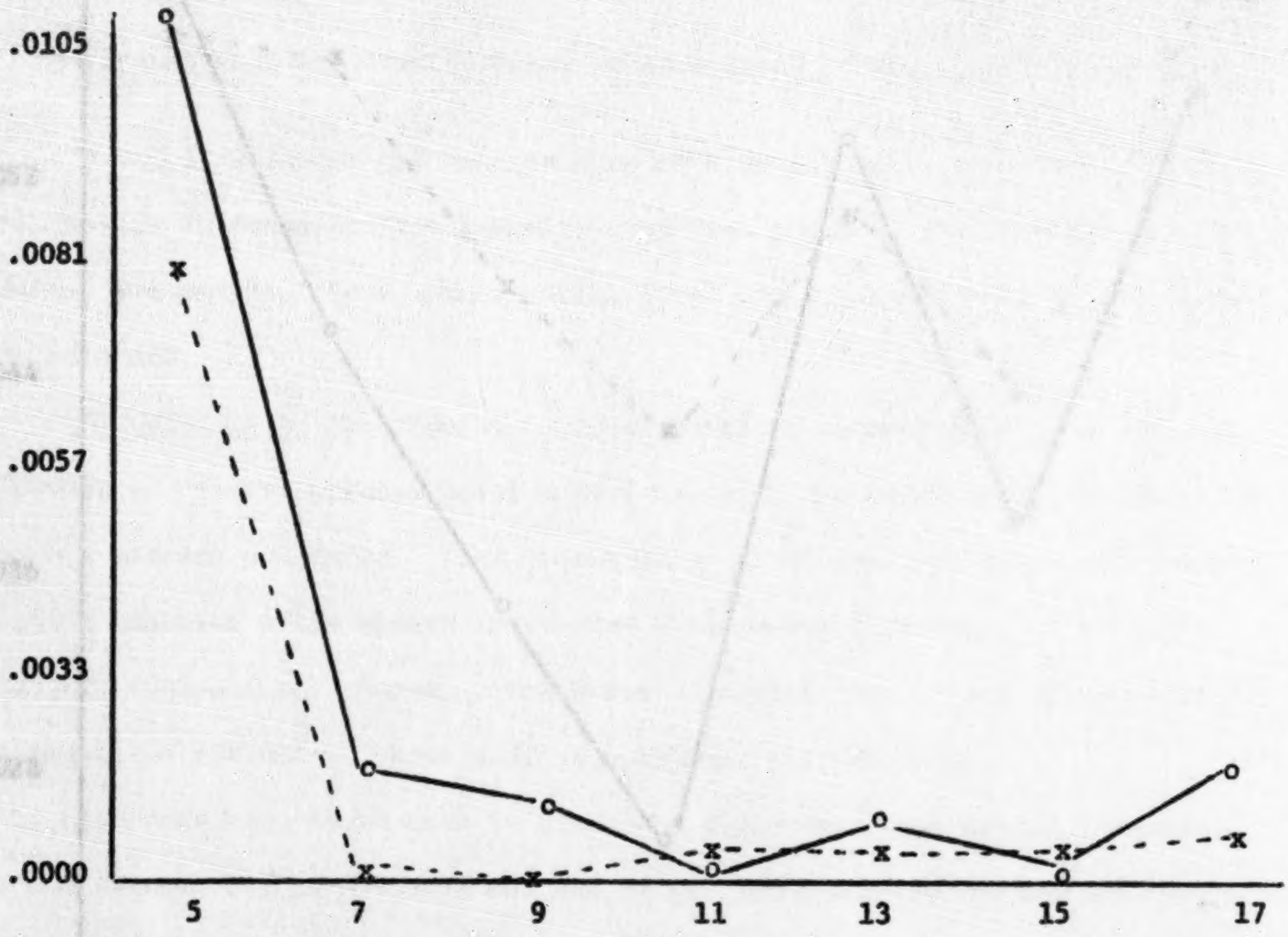

Figure 7.11 Oral Utterance Classroom

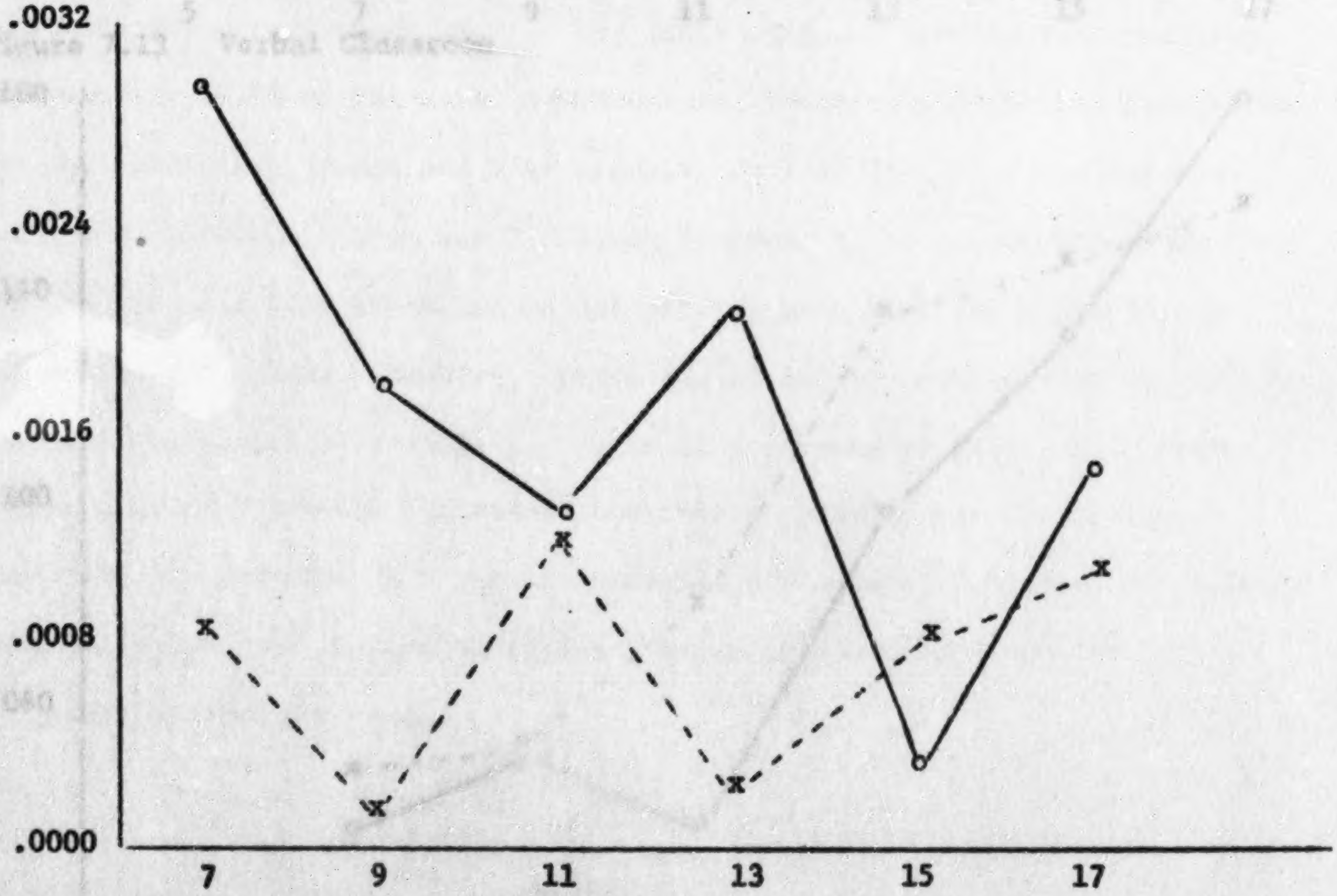

Figure 7.12 Oral Utterance Nonclassroom

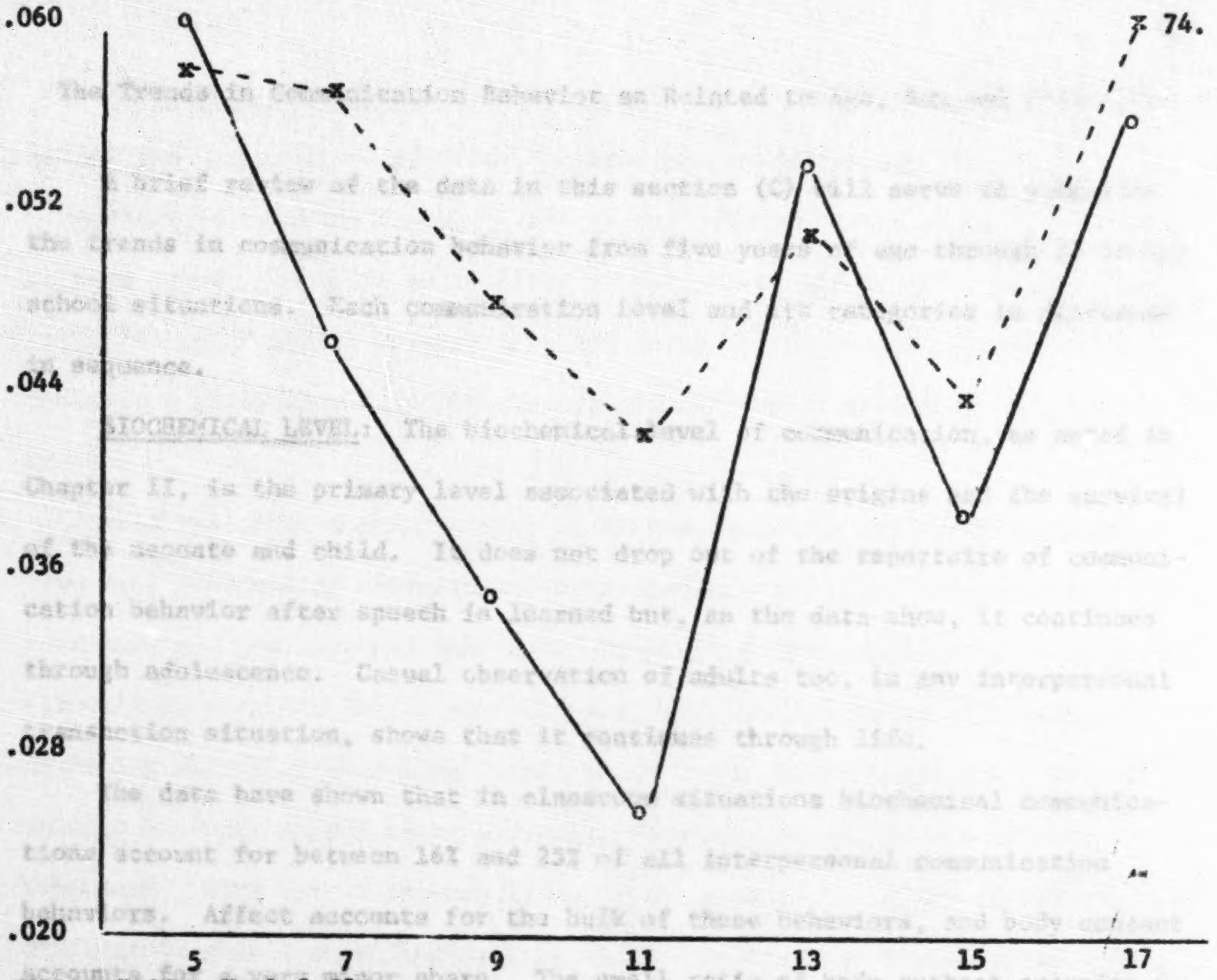

Figure 7.13 Verbal Classroom

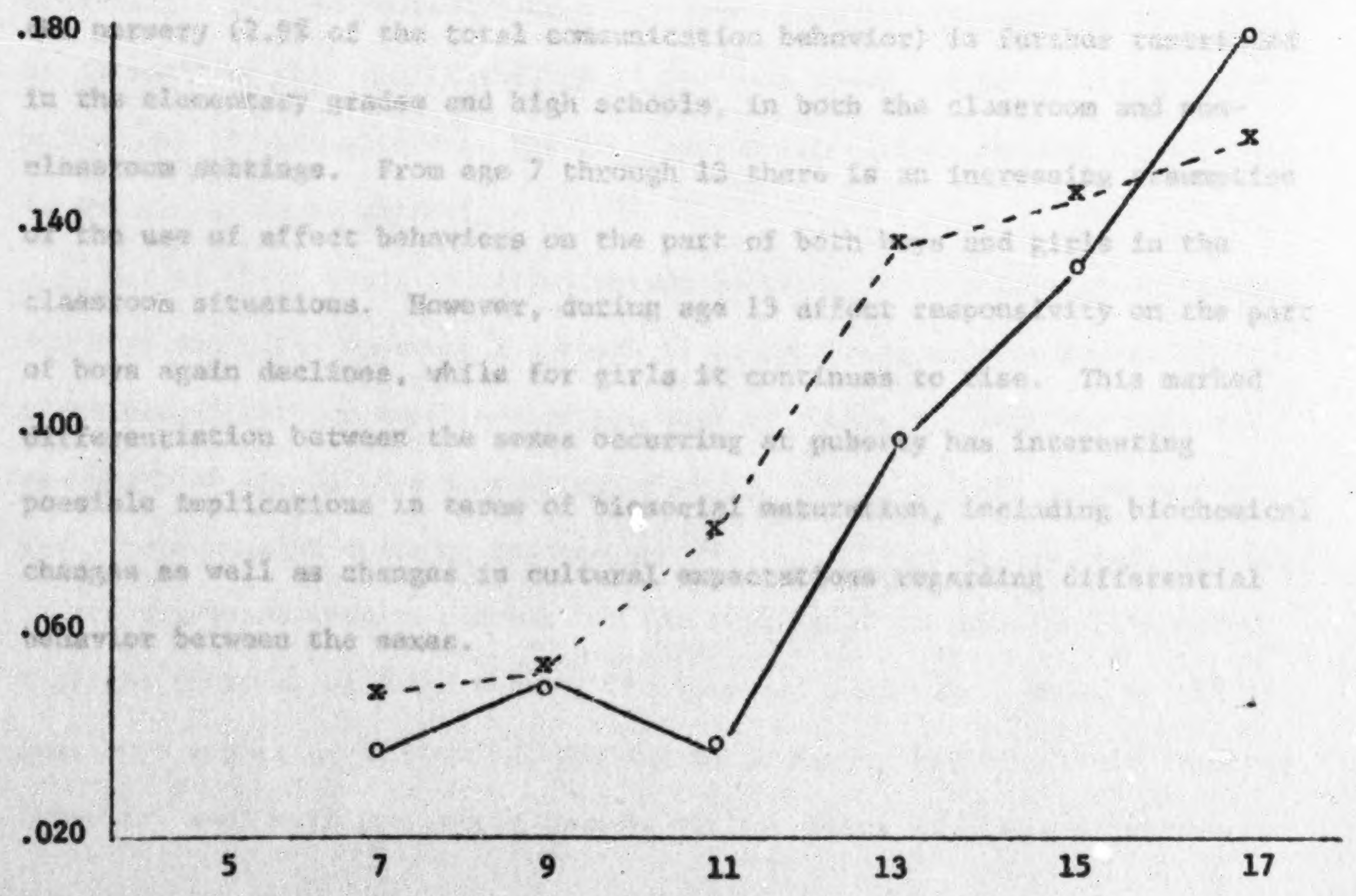

Figure 7.14 Verbal Nonclassroom

The Trends in Communication Behavior as Related to Age, Sex and Situation

A brief review of the data in this section (C) will serve to summarize the trends in communication behavior from five years of age through 17 in the school situations. Each communication level and its categories is discussed in sequence.

BIOCHEMICAL LEVEL: The biochemical level of communication, as noted in Chapter II, is the primary level associated with the origins and the survival of the neonate and child. It does not drop out of the repertoire of communication behavior after speech is learned but, as the data show, it continues through adolescence. Casual observation of adults too, in any interpersonal transaction situation, shows that it continues through life.

The data have shown that in classroom situations biochemical communications account for between 16% and 25% of all interpersonal communication behaviors. Affect accounts for the bulk of these behaviors, and body contact accounts for a very minor share. The small ratio of body contact occuring in the nursery (2.9% of the total communication behavior) is further restricted in the elementary grades and high schools, in both the classroom and non-classroom settings. From age 7 through 13 there is an increasing resumption of the use of affect behaviors on the part of both boys and girls in the classroom situations. However, during age 13 affect responsivity on the part of boys again declines, while for girls it continues to rise. This marked differentiation between the sexes occurring at puberty has interesting possible implications in terms of biosocial maturation, including biochemical changes as well as changes in cultural expectations regarding differential behavior between the sexes.

MOTOR MOVEMENT LEVEL: Motor movement communications, what Mead (1934) called the "language of gestures," constitute approximately 54% of all communication behavior in the classroom and 56% in the lunchroom. In the nursery school the ratio is slightly higher, i.e., 62% of all communication acts. The differences between boys and girls are minimal in nonclassroom situations while in classrooms the differences appear primarily at ages 7 and 15.

When the motor movement level is broken down into its three categories some very interesting differences appear between the sexes and between classroom and nonclassroom behavior. There is a sharp decline in the use of extremities from the 5th to the 7th year, with girls' use of this behavior declining more than does boys' (the same as with affect behavior). From 7 through 15 there appear to be irregular fluctuations in the use of these behaviors. From age 15 through 17 boys show a sharp trend toward restriction while girls show a sharp increase in these communication behaviors in the classroom. In nonclassroom situations there is a general decline in the use of extremities from age 11 through 17 for both sexes, although the frequency in the use of extremities in the nonclassroom situations is much higher than in the classroom situation.

Use of their heads in communication behavior shows a consistent decline for boys and girls from age 5 through 17 in nonclassroom situations. In classroom situations boys' use of the head is relatively constant with the exception of age 13 when it declines sharply, but is quickly recovered by age 15 and remains constant through age 17. Girls' use of the head, however, in the classroom shows a general decline from age 5 through the 15th year. A slight increase is noted between the 15th and 17th year. Thus, by the 15th year boys appear to be nodding, shaking their heads, shifting their "looking behavior" much more frequently than do girls. These differences between the sexes appearing around the time of puberty do indeed have interesting implications regarding the differential use of these behaviors in the culture. Perhaps the boys at 13 begin what is popularly known as "girl watching."

The use of postural shifts shows a consistent decline from age 5 through the 17th year in classroom situations for both boys and girls. In nonclassroom situations posturing behavior declines until age 15 when it begins to rise and continues rising through the 17th year. Apparently the approach of adulthood is associated with increased use of postural shifts as communication behavior.

SPEECH LEVEL: Speech accounts for only approximately 7% of the communication behavior of both boys and girls in the school. Almost all of this involves the use of verbal symbols. Oral utterance without verbal form, such as yelling, grunting and groaning, consitute less than 1/10 of 1% of the oral communications.

In the classroom situation the use of speech accounts for approximately 7% of the five-year-old's communication and this percentage shows a sharp decline for boys until the 11th year and a somewhat less steep decline for girls. Around the 11th year, however, both sexes tend to become much more verbally active. By the 17th year in nonclassroom situations both the boys and the girls are using speech in more than 15% of their communication behaviors. It is interesting to note that speech is sharply reduced by the first grade experience and continues to decline in the classroom situations until around the age of puberty. The upward curves in speech behavior for both boys and girls were continuing at the cut-off age of 17.

TECHNOLOGICAL LEVEL: As noted previously, the five-year-old child shows a remarkably consistent pattern of interpersonal communication behavior with all four levels contributing almost equally. By the beginning of the second year in grade school, however, the use of technological extensions of speech have increased sharply in the classroom (at the expense of the other three levels) and continue rather consistently to account for from 18% to 30% of all communication behaviors in school. In nonclassroom situations, however, technological communications are very infrequently used, with the percentage ranging from 0 to 3.4%. The differences between the sexes are noticeable at the 7th and again at the 15th through 17th years. Girls during the first grade appear to acquire the use of technological communications more rapidly than do boys. From the 9th through the 11th year the sexes are about equal, but the girls lag behind the boys from 15 through 17 years. What this means in terms of the generally found tendency for girls to exceed boys' grades through elementary and junior high school would require further research. The sharp reversal in the frequency of the use of technological communications occurring around the 15th year and continuing through the 17th year may be reflected in the higher grades obtained by boys in senior high school as compared to girls.

CHAPTER V

IMPLICATIONS

The implications of this study are found not only in the data which have been discussed in the previous chapter, but also in the theoretical formulation and the research methodology out of which the data have emerged. While it would be possible to extract a wide range of implications the discussions will be confined to communication theory, research methodology and educational theory and practice.

A. IMPLICATIONS FOR COMMUNICATION THEORY

Reference has been made repeatedly in the earlier sections of this report to the fact that a behaviorally based communications theory has yet to be fully explored and developed. Mead's behavioral approach to communication in the early part of this century tended to be bypassed in communications, psychological and educational research. However, Mead's work, as well as earlier work in sociology, anthropology, and biology plus the more recent data in behavioral science research has been the basis of this investigation and has led to the findings which have been discussed previously.

The data presented in Chapter IV show that interpersonal transactions occur on the four levels of communication which have been postualted (Richmond and Buehler, 1962). Furthermore there is clear evidence that the uses made of these four levels vary among children with respect to age and sex. In short, different behaviors enter into communication processes and these differences are related to age and to sex at the minimum. From the present empirical findings it is not at all unreasonable to predict also that these differences in the behavioral processes involved in communication differ with respect to culturological, sociological, psychological, and other variables which influence individual and group behavior. These latter variables are subjects for further research, however.

There is evidence in this study also that in the school situation the child's communication behavior is not limited to speech and technology even though the curriculum and the instructional technology concentrate upon these two levels. Discussion of this will be deferred until a later section, but mention of it is made in this context to indicate that the communication behavior of children, even where the official system utilizes only two communication levels, does in fact include all four levels. It seems reasonable therefore to state that further considerations of research on communication must take into account the full range of communication behavior, else theory construction will be limited simply to speech behavior and/or technological communication. There is no denying the fact that in a technological society great emphasis, importance and status must be attached to the technological level of communication and the use of verbal symbols. This is particularly true of social organization and operations on the community, national, and international levels. But it is an obvious fact that in the day-by-day living processes of people, technological communication is not a universal medium nor is speech a universal necessity. Many cultures exist without a written language. It is a well-known fact too that children survive, learn and mature for months after birth without the use of verbal symbols and throughout life an enormous amount of essential learning and adaptation takes place without the use of verbal communications.

It is easier at this juncture to point to the deficiencies in communication theory than it is to postulate a theoretical scheme which would account for all of the communication phenomena in human life. The approach represented in this study has been empirical and datum has been behavioral. We have postulated as parsimoniously as possible to provide a focus for behavioral observation and analyses of the cumulative data. Theory refinement thus would follow empirical findings rather than precede such findings. The danger in any reversal of this process has been cited by Krasner and Ullmann (1965) who note that theories of psychotherapy and of personality have been postulated and then data has been collected in an attempt to substantiate the theory, with negative and/or questionable results. The same has been said of the teacher-learner process (Gage, 1963).

Our data supports the assumption that communication theories whose data are restricted to verbal symbols or technology are inadequate. Furthermore, the study has demonstrated the feasibility of obtaining empirical data on the full range of human communications which must be taken into account in theory construction.

B. IMPLICATIONS FOR RESEARCH METHODOLOGY

1. For Communication Research

Research on communication behavior still lacks any generally accepted criterion as to what behaviors should be taken into account. As recently as 1964 Nathan, Schneller and Lindsley, in an article entitled "Direct Measurement of Communication," focus only upon looking, talking, and listening behavior occurring in the interpersonal transaction situation identified as a psychiatric interview. However, Buehler and Richmond (1963) observed communication behavior in many interpersonal situations including psychiatric interviews and it was obvious that looking, talking and listening behavior constituted only a small part of the ongoing communications events in the interview situation, and that all of the four levels postulated in this study, including the eight categories, are utilized in varying degree by both patients and clinicians. The former study is illustrative of many studies that could be cited in which the classification systems exclude such communication behaviors as body contact, affective behaviors, postural shifts, etc. These omissions lead to acute paradoxes in behavioral science for the simple reason that other research depends upon the communications behaviors which are omitted from the kind of study cited above. We are referring here to the very active and impressive research area known as social learning. In this area, every one of the eight categories of communication behavior postulated in this study is used frequently as either positive or aversive reinforcement agent and the attentive researcher gives them a significant place as behavioral contingencies even though he does not always refer to them as communication events.

The gist of what is being said here is that communications research is in great need of a methodology which can take into account the full range of human communication, particularly the full range which occurs in interpersonal transactions. The past neglect of interpersonal transactions in communication research accounts no doubt for the absence of a well defined research methodology. The methodology for research on the level of verbal symbols and technology where communication research has concentrated, is well developed. The accumulating data obtained by the method presented in this study suggests that a viable method for researching the full flow of communication behavior may now be available.

No claim is made that the methodological problem has been resolved in this study. The only claim to methodological uniqueness lies in the fact that the method makes it possible to observe and record all of the observable communication events which occur in an ongoing interpersonal transaction process. Once the necessity for such a methodology is accepted it will be possible to develop more refined instruments to achieve more exhaustive records of interpersonal communication events. It is now possible of course to achieve more minute protocols in any one of the eight categories presently used if the observations are limited to single level measurement. Previous to the development of the ICBAM research has tended to focus in a detailed manner upon one or two levels and has invariably omitted other levels of categories (Birdwhistell, 1960; Hammond, 1965, etc.). There are still many current studies which depend entirely upon audio tape recordings in analyses of communication events. It should be obvious by this time that the minimum requirements for tape recording of interpersonal communication would require video tape. But the video tape does not solve the classification problem because it does not demand any particular focus of attention on the part of the data analyst. It simply gathers the data and preserves it uncoded.

Another unique aspect of the ICBAM is that it is simple to use in obtaining reliable protocols of communication behavior. Key Panels are inexpensive to acquire and therefore are easily learned by persons of diverse backgrounds as we have shown in our previous research. While a video tape would be useful for developing training materials as well as for laboratory studies, the eight categories subsumed under the four levels represent behaviors that are easily observed by anyone without resorting to technological instrumentation.

Another common characteristic of research is to postulate some instrumental construct and require the observer to conduct a running interpretation of behavioral events and record these events in terms of their assumed instrumental value. Such protocols of course are no more than a record of the subjective interpretations of the observers and leave out the behavioral events which the observer was continuously interpreting. Illustrations of this type of study are found in Hammond who studied "what one person learns from another in interpersonal communications" (1965). A detailed list of the behavioral events involved in the learning situation is omitted and recordings are made of the assumed learning, defined in cognitive terms.

A summary to this section should properly be entitled "Toward the development of a research methodology in interpersonal communications." Further methodological development would include, at the minimum, added categories under biochemistry (Level 1), as well as in motor movement (Level 2). In these two levels there are no standard differentiations in the events such as there are in Levels 3 and 4. A wide variety of speech behaviors as well as technological behaviors has been identified and categorized in linguistics and technological literature. In comparison, Levels 1 and 2 are in a very primitive state of within-level differentiation. The fact of the matter is that much research and writing simply lumps all of Levels 1 and 2 into a general "cache basin" labeled "nonverbal," and lets it go at that; e.g., Krasner, L., Studies of the conditioning of verbal behavior. Psych. Bull., 1958, 55, 148-170.

2. In Behavior Modification Research

A field of research which converges with the research methodology used in this study is social learning. This area, frequently referred to as "Behavior Modification" (Krasner and Ullman, 1965), is replete with data pertaining to behaviors which are classified by the ICBAM as Levels 1 and 2. Social learning researchers take it for granted that very significant learning occurs through the human use of Levels 1 and 2. Preliminary studies (Furniss, 1964; Buehler and Patterson, 1964) suggest that the use of the interpersonal communication behavior analysis method (ICBAM) in social learning research makes possible a more precise analysis of both the behavior to be modified and the modifying contingencies. Consequently, this methodology has important potentials for social learning research as well as for communication research per se. This was graphically illustrated when Furniss (1964) observed interpersonal communications occurring in a peer group of delinquent girls and found that 82% of all communication events which reinforced delinquent attitudes and behavior occurred on Levels 1 and 2 and only 18% occurred on Levels 3 and 4. Furthermore she found that staff members who were unaware of their own communication behavior tended to reward and punish delinquent behavior indiscriminately. Such social learning data would be completely lost had the research methodology been confined to the use of audio tape with the researcher focusing only upon subjects' speech.

The fact that some of the social learning research is now taking place in educational settings (Bijou, 1960; Patterson, 1964; etc.) indicates that a substantial scientific literature is accruing which points to significant learning occurring through peer group communication behavior in educational settings. Outside of research studies these behaviors and their learning products are, of course, mainly informal and not systematically introduced, controlled or prevented by the official curriculum or instructional technology. Nevertheless, their impact upon student attitude and behavior is well documented in psychological research.

If the rapidly expanding field of social learning research should increasingly utilize school settings as naturalistic laboratories, and this would appear likely because of its emphasis upon socialization processes, a growing body of empirical data on the learning effects of peer group and teacher-student transactional behaviors will become available. These behaviors, by the definition of the parameters of this study, are interpersonal communications. The more precisely such communication behaviors are identified, observed and recorded, the more valid will be the data on the acquisition of new behavior.

It is important to note too that social learning research shares the same focus upon the immediate transactional events and situation as does our approach to communication. Reference has been made previously (Richmond and Buehler, 1962; Buehler and Richmond, 1965) to the fact that interpersonal communication functions to integrate the individual intra-personally and interpersonally, while the function of information theory is to project communications in time and space. Such information media as books, newspapers, radio, television and art forms project and store communications. Interpersonal communication events however are immediate, ongoing and transient. Social learning data indicates, however, that their effects upon personality, attitudes and behavior are relatively permanent. The social learning researcher seeks to change behavior by mainipulating the immediate environmental contingencies;

i.e., transactions rather than by seeking to recall the past and unraveling assumed past causes in the traditional manner of evocative therapy. This of course has been a standard modus operandi in educational activities. A child is taught to write correctly by correcting his writing in the present rather than by attempting to unravel antecedent causes of spelling errors. The focus upon present, ongoing behavior which is shared by interpersonal communication research and social reinforcement learning research is uniquely appropriate in educational settings and compatible with the traditional educational emphasis upon current performance.

3. In Educational Research

The de-emphasis upon empirically determined behavior at the expense of personality, instrumental, and other nonoperationally defined constructs which has characterized the social sciences in general has had its impact upon educational research. A survey of educational literature uncovers little empirical data on student behavior, teaching behavior, peer group behavior in classrooms, or behavioral referents to curricular material. It is true of course that certain kinds of student or teacher behavior (performance) underlies such terms as "I.Q.," "achievement," "instruction," "class management," etc. However, relevant social interpersonal and vocational behavior is seldom linked to these terms.

Moreover, as Schalock, Beaird and Simons (1964) indicated "The educational field at the present time lacks both a theoretical framework that identifies relevant variables within the educative process and instruments by which to measure them." The same writers add that "Observational systems available for the measurement of teacher behavior in the classroom typically focus upon variables which lack theoretical relevancy."

These considerations suggest that the frame of reference, research methodology and accumulated data outlined in this study may have direct relevance to some of the current issues and needs in education as discussed below.

a. Teacher-Learner Processes

If all transactions between teacher and student are communications, occurring on all four levels, then every such transaction becomes a part of the student's learning experience. The teacher is teaching whether she speaks or not; whether she uses written materials or not. Her communication behavior becomes an essential part of her teaching. Teacher training thus would have to include training in interpersonal communication behavior and the trained teacher would be one whose nonverbal as well as verbal behavior facilitates the maturation processes of the student. Empirical data on such maturation facilitating behavior are not presently available. The principles of social reinforcement are well defined in the literature but there are no known instances in which teachers' communication behavior, on all levels of communication, is formally scheduled as a part of the instructional input.*

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* "Direct observation should play a crucial part in the most fundamental kind of research on teaching - the search for effective patterns of classroom behavior - the type of research most worthy of the name Methods Research. The latter term is used here to include any study whose purpose is to find out how a teacher should behave in the classroom to achieve more effectively one or more of the goals of instruction.

"The classic design for methods research requires that one (or more) classes be taught by an experimental method and one (or more) by a 'control method.' The dependent variable is a measure of the gains of pupils in each class on an appropriate test. The classic design does not involve any observation of the teaching in either class to find out whether - and to what degree - the method supposed to be applied actually is applied. If the results of the experiment do not justify rejection of the null hypothesis, there is no way of eliminating the possibility that the failure to find a difference between methods may have been due to the fact that both classes were taught by the same method, despite the fact that the teachers were supposed to use different methods. But if appropriate measurement of the teaching behavior under each experimental condition are made by direct observation, this possibility can be eliminated. If desired, the relationship between the degree to which the method is applied and the amount of pupil gain can be studied directly."

Donald Medley and Harold E. Mitzel. Measuring Classroom Behavior by Systematic Observation. N. L. Gage (Ed) Handbook of Research on Teaching, Page 249-250.

When definitions of communication in teacher training literature and practicum are limited to speech and technology, it probably is inevitable that other levels of communication are regarded by the teacher as not only unimportant but also as interference with the teacher-learning process. That this process, as presently defined in the curriculum, stresses technology at the expense of the other levels of communication, is documented throughout the data shown in Cahpter IV. The kindergarten system, as this chart shows, allows an approximate equal use of all four levels of communication, but during the first grade the present instructional technology forces upon the child a drastic imbalance in his former integrated communication behavior. He now must severely restrict his affective and body contact responses, stop using verbal and motor movements as frequently as before, and learn quickly (within one year) to behave predominantly on the technological level of communication. What this does to the child's emotional equilibrium, his feelings and attitudes toward the school as a social system, and his general maturation process, can only be speculated upon at this time. In discussing why "many of our children dislike school or finish their schooling uneducated" Hall (1959) calls this great stress upon reading in a child's early educational experience "one of the obvious defects in American pedagogy" (Page 55). A series of researches on the effects of this forced imbalance in the communication behavior, and consequently on the maturation processes of a six-year old child, would be necessary to identify the effects. Research in this area would appear not only reasonable, but necessary at this time in view of the unsolved problem as to why great numbers of children either drop out of or limp their way through, the public's school system. This also makes necessary a reexamination of the concept that such children are "not educable" according to the classic definition of educability.

It is interesting to note too that the data on the chart indicate that during the second grade the children begin gradually to resume their use of affect in their interpersonal communications, while motor movement continues to decline, reaching a very infrequent level during the senior high school years. The four research assistants who collected the data in this study, all of whom were Ph.D. candidates taking advanced seminars, noted that in their experience the graduate seminar reproduced essentially the same communication system utilized in the kindergarten. Without belaboring this point unduly, we would mention that the public schools' inability to retain large numbers of children through adolescence is a matter of great public concern and alternate educational systems such as the Job Corps are being promoted by political and economic leaders. Whether these substitutes will utilize behavioral science knowledge in the area of learning and communication is of course a moot question. Nevertheless Hall's awareness of the "obvious defects in the American pedagogy" is shared by responsible officials in government.

b. The Peer Group Interpersonal Communications

After a series of studies of social reinforcement learning in the laboratory, the home, and the school, Patterson (1964) commented that the "peer group is the forgotten teaching agent in education." This is indeed a thought provoking observation. There is well documented evidence that the impact of peer group interpersonal transactions increases as the child approaches adolescence and rapidly reaches the point in which the peer group exercises much more influence in both shaping and controlling behavior than do adults, regardless of the authority position of adults. The data in this study indicate that regardless of the organization and the management of the classroom, these informal interpersonal communication processes continue, albeit sub rosa. These data support Patterson's further comment that the peer group is in fact a "teaching machine which has its own built-in programming" (1964). Efforts to suppress these communications serve simply to alienate the informal communication system among the peer group from the formal communication system promoted by the teacher. Under these conditions, the peer group processes to which Patterson alluded become indeed the available but forgotten tool in education.

Even though the formal teaching technology does not utilize the peer group as teaching agent the fact of the matter is that peer group teaching and learning does go on in the classroom. In other words, communication transactions are a universal phenomena when two or more persons are in physical proximity. These transactions can be either utilized, ignored, or punished by the teacher. They can support or negate the effort of the official communication system of the school to promote socially appropriate knowledge and skills. To the extent that these informal transactions are ignored or suppressed in the school, one of the most significant learning resources available without financial cost to the school is wasted. The data in this study simply add to the existing data in the behavioral sciences which indicate that there must be an integration of the formal and informal communication systems if an integrated social system is to be achieved. This means, in terms of educational practice, that peer group communication processes must be incorporated into and utilized by the social system of the classroom.

c. Curriculum Construction

The design of the curriculum serves to structure and to control the teacher and the student behavior in the classroom. It shapes and controls the products of the school as a social system. The data in this study simply verifies common knowledge, that is, that the curriculum concentrates upon and aims at facilitating maximum possible learning on the technological level of communication.

Current dropout, low reading and other technical achievement rates indicate that in spite of the concentration upon technological achievement, for many children the curriculum fails to develop the minimal social-vocational levels of technological skill. A reasonable inquiry would be the extent to which the suppression of Levels 1, 2, and 3 communication behavior in the classroom retards the achievement of skill even on the technological level? An allied question is whether the concentration upon Level 4 behavior, at the expense of Levels 1, 2, and 3 has been determined by empirical data on learning or by social control and other considerations not empirically relevant to human growth and learning. Certainly it is easier to manage a group when behavior on Levels 1, 2, and 3 is at a minimum because the increased volume and the complexity of transactional behaviors which inevitabley occurs when behavioral restrictions are reduced, imposes great demands upon teacher and administrator social leadership skills.

The maximum use of a child's full range of communication behavior, which would mean in effect utilizing the peer group as a teaching agent would necessitate a major revision of the current, technologically focused curriculum. Also, it would necessitate major changes in the instructional role of the teacher. There are, no doubt, models for such revisions operating in many areas of education but the official curriculum from the first through the twelfth grade in the school system in which this research was conducted was technologically oriented.

Research on this problem would necessitate many methodological approaches, of course. One approach would be to: determine the communication behavior which the child brings to the school situation; design instructional behavior on the levels of communication utilized by the child and his peers; and utilize the interpersonal communications of the peer group, on all levels, in designing classroom activities aimed at social, emotional, technological and vocational norms.* Involved in this would be a reconsideration of such concepts and current practices as: classroom control; discipline; determination of the specific goals for the immediate and long-range achievement for each child; and the evaluation of student progress. Such an approach is suggested as a possible means for making the social system of the public's school conducive of growth and learning appropriate for each child.

d. Social System Analysis and Control

The school is a social system of which the classroom is a subsystem. Much attention has focused upon systems of control in social systems in recent years; in psychological, sociological, political science, and related fields. The preoccupation with this concept appears more visible in industrial circles, particularly those connected with the aerospace industry, than in any other sectors of public life. However, a vast amount of literature has been accumulating through psychological and sociological research in institutions such as mental hospitals, prisons, and the correctional field in general. Research in this area has not been particularly visible in the field of education.

There is, however, some very pertinent literature on the subject which has stemmed from education since Hartshorne and May's famous studies of deceit among school children. The findings in this study have been replicated again and again and indicate that behavior is a function of the social system in which the behavior occurs. Studies by Kurt Levin spearheaded these analyses in social psychology and related fields. A perusal of social science literature pertaining to institutions indicates without any doubt that the social milieu is a primary influence in both shaping and controlling behavior and that the system of control in the social milieu is a major if not the major variable influencing the behavioral outcomes of the social system. No less a document than the report of the Joint Commission on Mental Illness (the five-year study of mental health programs in the United States, financed by the Federal Government) noted the fact that the social psychological approaches in institutional organization and control were having the more lasting effectiveness in the care and treatment of patients. This thrust in social system research has led, of course, to the general opinion in the correctional and mental health fields that the large institution is inimical to the goals of behavior modification in the direction of social norms because of the tendency of a large institution to "institutionalize" the resident.

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* In his address of the President to the Seventy-third Annual Convention of the American Psychological Association, Chicago, Sept. 4, 1965, Jerome S. Bruner mentions the tendency of instruction to utilize "telling out of context rather than showing in context" and "what is imparted often has little to do with life as lived in the society."

One of the concepts which has emerged from these studies is that the larger institution tends to develop systems of social control, operationalized through administration, that impose uniformities in behavior which suppress the development of individuality and of group identification. People, that is residents, come to be treated "en masse" rather than as individuals and as members of meaningful subgroups. Administratively prepared technological communications become the instrument for social control, replacing interpersonal communications. A parallel finding is that spontaneous human groups cannot arise, exercise any therapeutic, corrective or educational influence, unless the surrounding social system allows the small group subsystem considerable autonomy. Furthermore, this autonomy has to include the peer group, else the subsystem, however autonomous the leader may be, still operates under centralized control and authority.

These general backgound statements have been made simply to point up the fact that the social control system of a school, including its classroom subsystems, is a matter of importance for scientific investigation. This is particularly necessary as the behavioral sciences, including education, move from the traditional self-actional concepts of behavior and further develop operational definitions of human development and behavior in terms of transactional processes.

The ICBAM lends itself to social system analyses. While the subjects in this study were students, nevertheless in the process of observing student communication behavior, the social control system within the classroom, the lunchroom, and other areas of the school where children were observed could not help but be noticed by the data collectors. While we have no firm data on these phenomena to report, nevertheless some very positive impressions were obtained which may be used for generating specific follow-up research.

It was noted that in general, social control in the classroom as well as in the lunchroom, etc., was vested in the teacher. The teacher managed the social situation by controlling the interpersonal communication behavior of the students. Furthermore the teacher used her own interpersonal communication behavior as the instrument for social control. Such communication control mechanisms as the following were observed. The student could smile as long as the frequency of the smiling met with the teacher's approval. Body contact was permissible under some conditions, times and places and among certain students, but was rigorously suppressed at other times, among other students. Fleeting body contacts would pass unnoticed and as the data indicates, were relatively frequent, particularly among the younger children, but prolonged body contact would lead to a disapproving frown, a head shake, a verbal admonition or other negatively reinforcing communication behavior on the part of the teacher. Body movement, too, was permissible within certain parameters. There were times and places when it was permissible to stand, to sit, to walk. Speech was rigorously controlled. Free verbalization behavior generally was suppressed, particularly those verbalizations which would express negative thoughts or feelings toward peers, the teacher, or the situation in general.

Further descriptive statements could be made regarding the social controls which were utilized in the classroom, but the specific point is that the agent for social control was the teacher; the instruments for social control used by the teacher were her own communication behavior; and the phenomenon that was controlled was the communication behavior of the students. These observations suggest a definition of social system control as control of the communications in the social system, because it appears, from these observations, that the communication system maintains the social system.

The implications of this for research are many, indeed. How much body motion, body contact, postural shifts, affective behavior, free verbalization, and other communication behaviors are necessary for maximal learning for the 5, 7, 9, 11, 13, 15 and 17-year old child? It was obvious in the observations that the criterion used in determining the acceptability or unacceptability of the communication behavior of the students was whether or not these communication behaviors interfered with the official curriculum and schedules of the school. Whether this criterion would be validated by maturational data is a moot question, and in the opinion of the writers, deserves careful research. This point is emphasized because maturational theory increasingly involves the social interpersonal conditions which facilitate or distort normal biosocial growth.

The methodology in much of the research in this area involves behavioral observation; e.g., Blauvelt (1956), Harlow (1962), and the well known studies in Sensory Deprivation. The ICBAM shows potential for furthering research in this area and for documenting the behavioral events involved in differential social systems and their differential systems of social control.

C. CONCLUSION

In conclusion we would like to reiterate a primary principle of human behavior which is becoming predominant in the behavioral sciences, that behavior is a function of the social interpersonal system in which it occurs. Self-activating constructs which attribute behavior to antecedent causation or nonbehaviorally defined personality constructs are being abandoned in not only psychology, sociology and anthropology but in psychiatry as well. Thus, when inappropriate behavior occurs in the social system of the family, the community, or the classroom the social system is examined to determine what communications in the system are evoking and reinforcing the behavior. Throughout such social system analyses the focus is on behavior as transactions between and among living organisms.

Research on communication behavior alone will not produce a viable theory of education because in the educational enterprise behavior in the classroom (student or teacher) is not an end in itself. The acquisition of socially appropriate new behavior is the crucial matter. Behavioral observation systems which are not operationally tied into behavioral processes which produce new behavior lack theoretical relevance and usefulness for the teacher. The teacher has not only the right but an obligation to demand of the researcher some empirical answers to such questions as: "What difference does it make if I do or don't smile, touch the child, or ignore his behavior?" "What difference does it make if I use every means possible to eliminate or to fully utilize interpersonal transactions among the students in my classroom?"

It may be redundant in this context to reiterate that no teacher, counselor, therapist, or parent can change attitudes or thinking by bypassing behavior. The only human phenomen~~a~~on which anyone can cope with directly is behavior. But, what behaviors beget what behavior? Education, along with all the behavioral sciences sorely needs a theory of behavior. The literature is replete with theories of "ego identifications," "motivation," "group dynamics," "transference," and "existential vacuums." It is replete with theories of "teacher effectiveness" which lack any semblance of empirical linkage with what teacher A does to produce behavioral effect X in student B, particularly those behavioral effects which are manifest outside the classroom.

For these and other very cogent reasons the authors see the ICBAM as necessarily tied into research on the origins, maintenance, and alteration of behavior. The documentation of differentials in interpersonal communication behavior in terms of age, sex and other variables is only a preliminary step toward linking these behaviors, empirically, with transactional behaviors which modify behavior.

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